JANUARY 11, 1958
VOL. 154 — NO. 2

Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY

Published every week on Saturday by TELEPHONY PUBLISHING CORP., 666 S. Dearborn St., Chicago 5, Ill. Subscription $4.00 per year. Entered as second class matter at the Post Office at Chicago, Ill., under the act of Mar. 3, 1879.

VAC Guaranteed Circulation This Issue 12,272 of Which 11,661 Is Paid

MICROWAVE EXPANSION

Southeastern Telephone Co. of Tallahassee, Fla., installs microwave system. Above is company's ultra-modern toll center at Crestview, Fla., with microtower. See page 20 for complete story.

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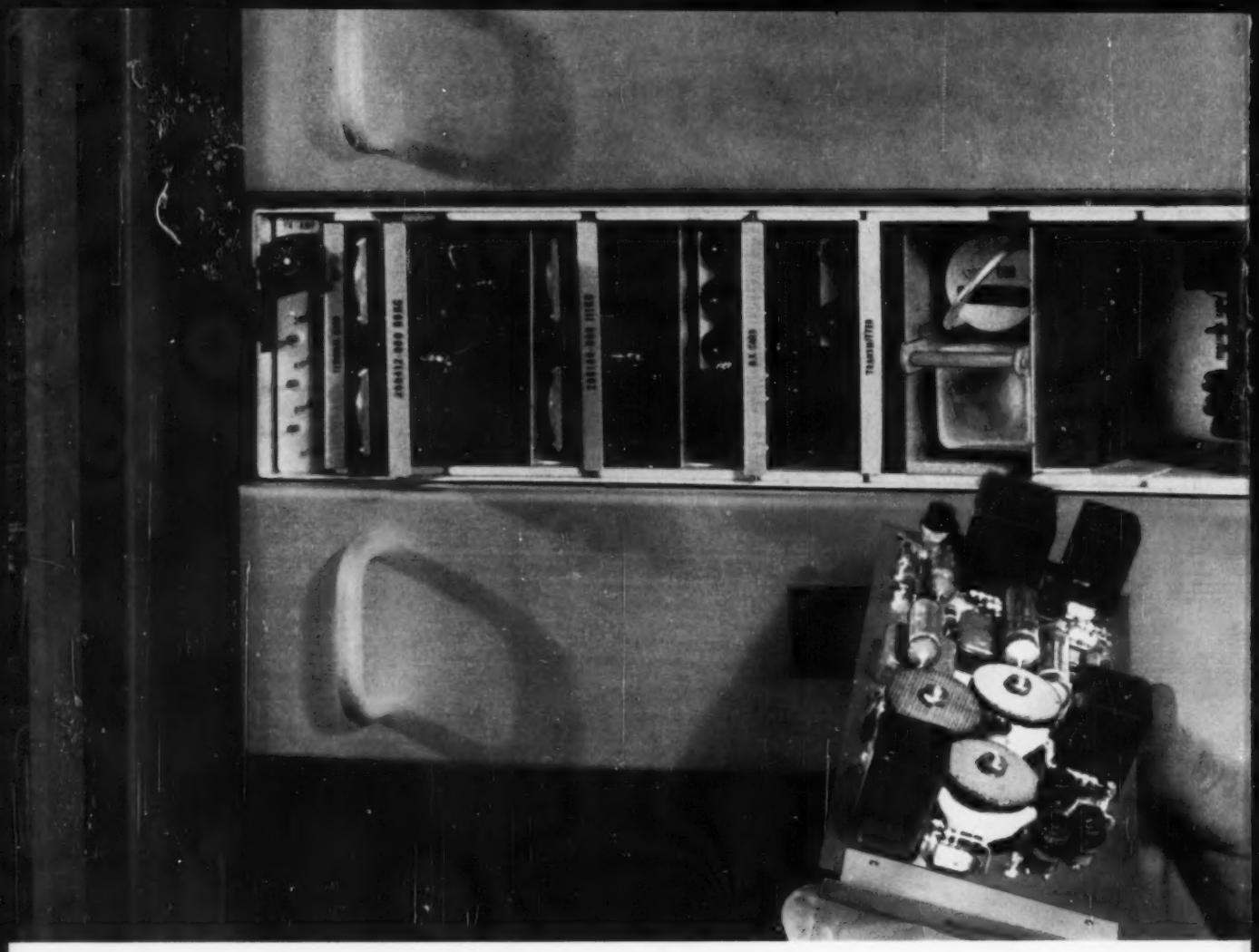

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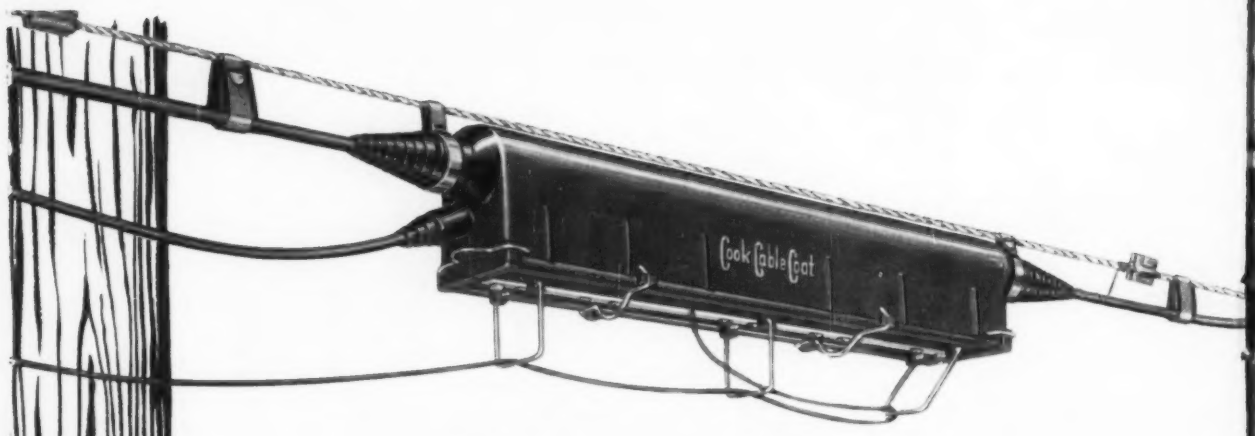

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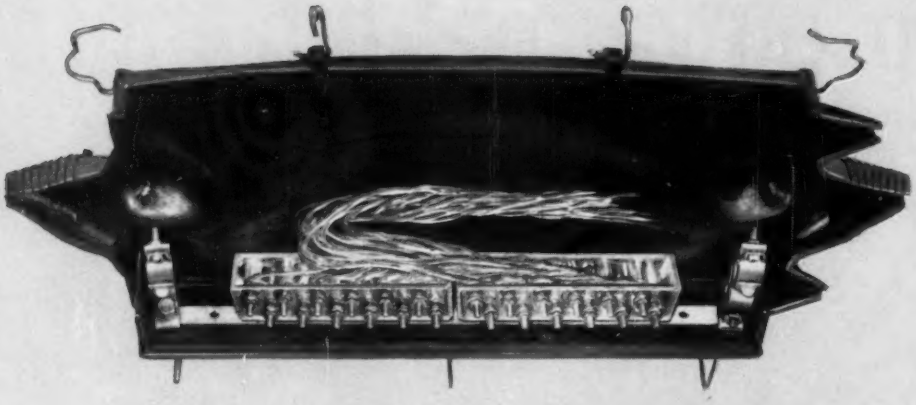

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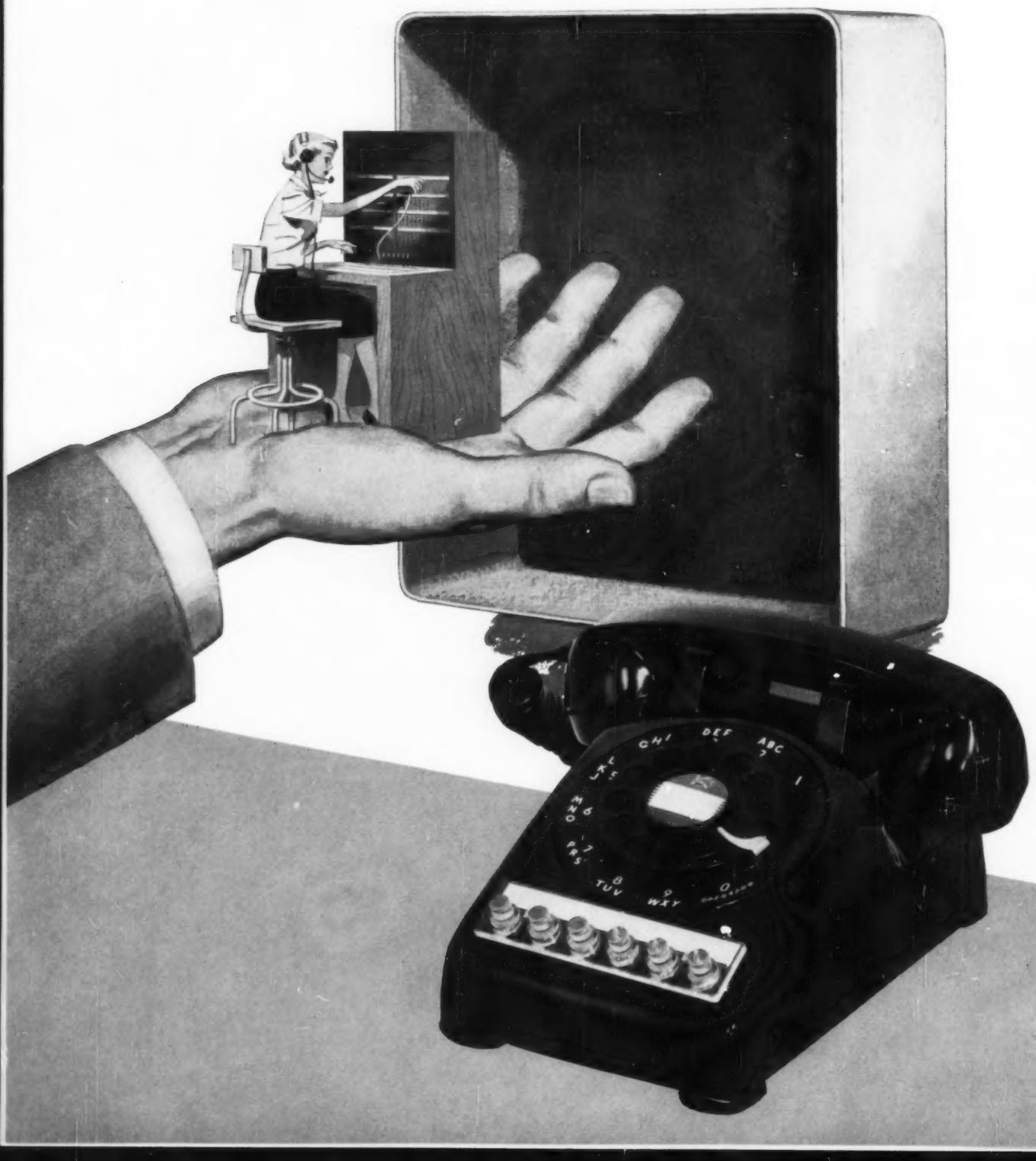

in the control box –

If you put a midget operator in the control box of your key system you might be able to match the service you get from your K1A1 system. But you would have a busy midget. Here are a few of the things she would have to do, and do efficiently and tirelessly.

She would have to handle up to 4 incoming lines. The K1A1 selects as many as 4 central office or PBX lines.

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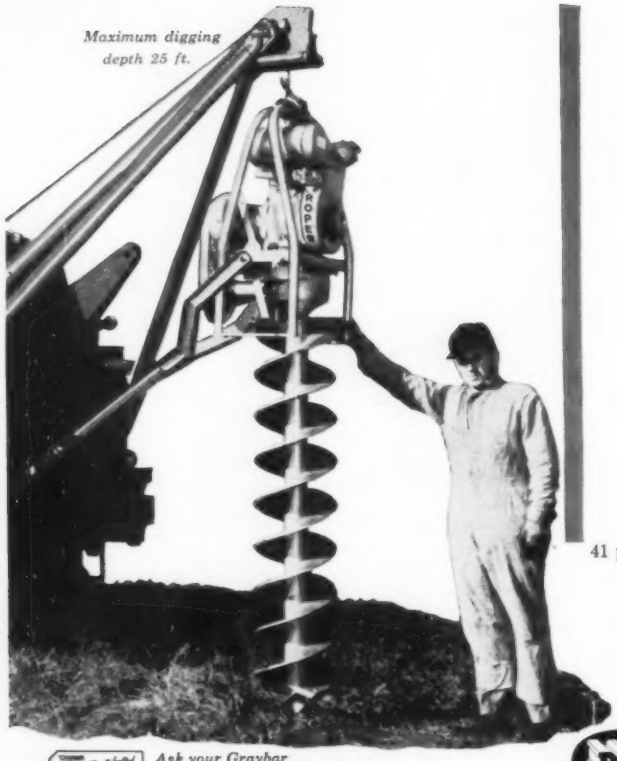

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FLASHES AND PLUGS

NEED FOR AN EAGLE EYE. As if telephone linemen didn't have enough to concern them while they're atop poles, now comes the story of Floyd M. Gurley, manager of the Ozark Telephone Co. of Colony, Kan., who, in December, was attacked by a giant bald eagle while atop a high pole.

Mr. Gurley was inspecting connections on a line north of Colony and had his left arm stretched out when the bird suddenly swooped down and sank its talons into his forearm.

He was treated by a physician for lacerations on the left arm and wrist. Next morning he was reported to be resting easily but would not return to work for another two or three days.

Gurley said the bird was the largest he has ever seen. It flew away as soon as Gurley shook it loose from his arm.

•

AND PAWS BETWEEN SENTENCES? Joseph G. Lindsay, editor of *Long Lines*, employe publication of AT&T's Long Lines Department, in a recent issue observed that owners of Siamese cats claim that they are almost human. He went on to say:

"Jenny, a feline friend of ours, is a case in point. Jenny, it seems, objects to the ringing of the telephone bell, especially when she is alone in the house. Either she realizes the call is not for her or else the sound grates upon her aristocratic nerves.

"At any rate, she has learned to take action. When the bell rings, Jenny leaps upon the telephone stand and with a deft movement of her paw removes the receiver.

"On telling this story, a telephone friend of ours asked a pertinent question. 'Does Jenny allow the phone to ring the recommended 10 times?' "

•

SOBERING THOUGHT. Illinois Bell Telephone Co., in its December issue of *Telebriefs*, a subscriber bill insert, presented the following interesting statistics, including the part of our lives spent in company with the telephone:

"By the time you're 70 years old, the statisticians tell us, you'll have eaten about 16,650 meals and slept about 200,000 hours. And if you're like most folks, you'll have spent 8,760 hours—a full year—talking on the telephone!

"That's a lot of telephoning. It averages 20 minutes every day from the time you're born until you reach three score years and ten."

Illinois Bell put in its bid for good public relations when it concluded:

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Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY
Since 1901

January 11, 1958

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Published every week on Saturday by TELEPHONY PUBLISHING CORP., 608 S. Dearborn St., Chicago 5, Ill. Entered as second class matter at the Post Office at Chicago, Ill., under the act of Mar. 3, 1879. 25c per copy (except special issues—40c). Subscription $4.00, 1-year; $6.50, 2-years; $8.50, 3-years. Add $1.00 per year for postage to Canada and Pan American countries; $2.00 per year to Foreign countries. Telephone WAbash 2-2435.

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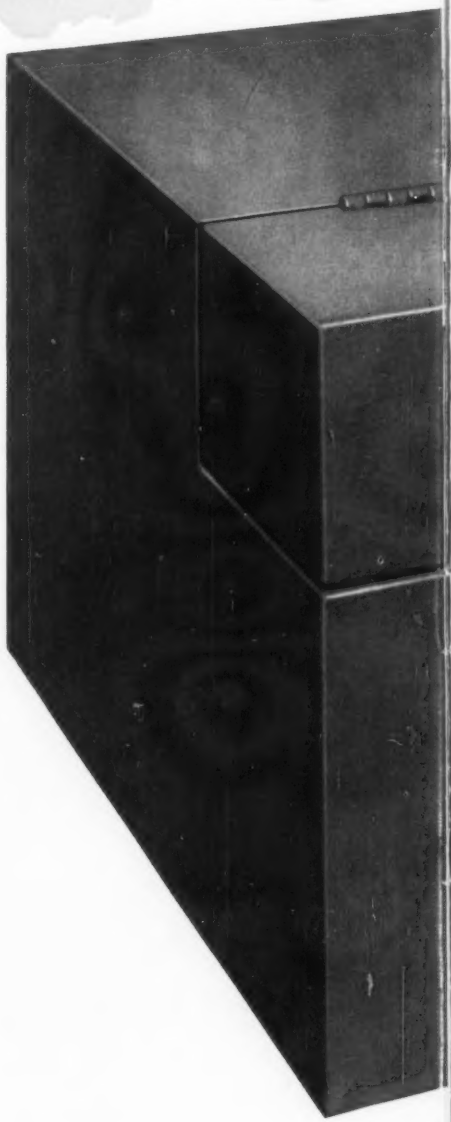

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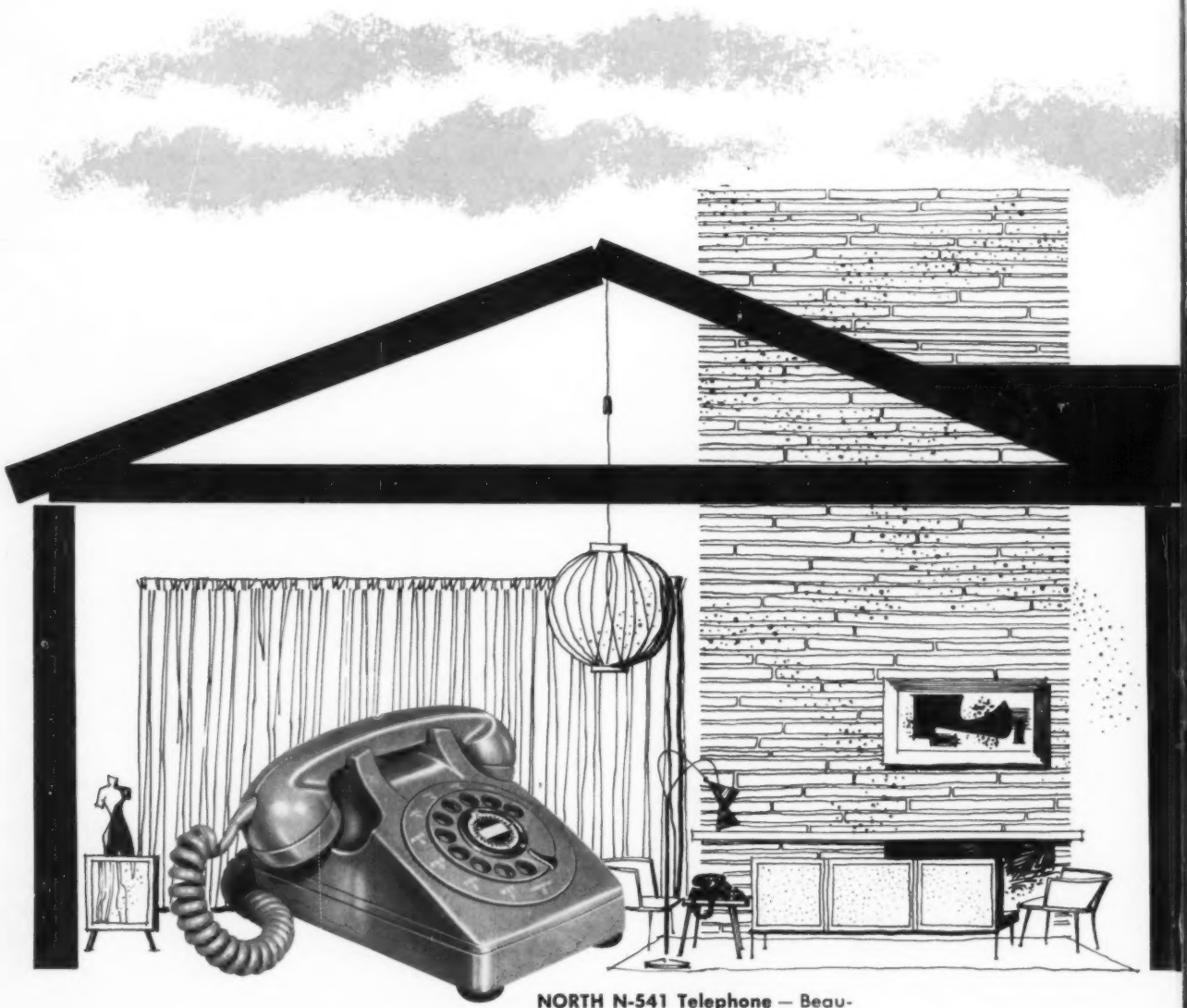

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IN THE NATION'S CAPITAL

BY FRANCIS X. WELCH, WASHINGTON EDITOR

Number of telephone companies start off new year with rate increases, although some are not happy about amounts allowed by commissions. Treatment of tax deferrals as result of accelerated depreciation continues to bother some state commissions.

A NUMBER of telephone companies in widely separated parts of the United States started the New Year off with substantial rate increases, but not all telephone companies involved were very happy about the results.

Among these increases were an 11.5 million dollar boost for the New Jersey Bell Co., which had asked the New Jersey commission for a total increase of $14,148,000. Chesapeake & Potomac Telephone Co. of Virginia started off the New Year with rates designed to yield an additional $7,228,000. This increase was approved by a split decision of the Virginia Corporation Commission (two to one), with one commissioner, Judge Catterall, taking the broad line that the majority's allowance of 6 per cent return on an original cost rate base resulted in too much of an increase.

Out in California four telephone companies serving the greater Los Angeles area received what will amount to a rate boost of $15,271,000 a year, as the result of a commission order shortening the distance for multi-message unit calls. A California commission order, effective Jan. 6, will benefit Pacific Telephone & Telegraph Co. (about $11,288,000), General Telephone Co. of California (about $3,125,000), California Water & Telephone Co. ($790,000), and Sunland-Tujunga (about $68,000).

The New Jersey Case

The New Jersey Bell Telephone Co. stands to get about 80 per cent of its requested increase, but the company's president, William A. Hughes, was somewhat disappointed. The company had prepared a very persuasive case for a fair return based on fair value. But the commission clung to a net investment or original cost rate base with an ostensible return allowance of 6.27 per cent. The commission said, in upholding its traditional use of a net investment or original cost base, that it could find "no compelling reason . . . to do otherwise at this time."

There was no indication that the company would take an appeal, despite differences of opinion in some quarters that the New Jersey commission is correctly interpreting the state law under the prevailing economic circumstances. There was, on the other hand, a hint that New Jersey Bell would attempt to live with the decision, for a while, anyway. This would seem to follow from this comment by Mr. Hughes: "New Jersey is a growing state. It has growing needs. We shall do our best to make the new rates do the job. At the same time, however, we must keep our financial status constantly under review to make certain that earnings are maintained at the level required to continue the high quality of telephone service which our state now enjoys."

The Virginia Rate Increase

In the case of the $7,228,000 rate increase for the Chesapeake & Potomac Telephone Co., there was a possibility that six protesting cities and two counties might carry the case to the highest state court. The C&P company did not dispute or make any issue about the use of a traditional original cost rate base by the Virginia commission. It has been the practice of this commission to allow a 6 per cent return on such a rate base. That practice has been approved by the Virginia Court of Appeals.

The odd thing about the Virginia case is the view expressed by the dissenting commissioner, Judge Catterall, who would apparently do away with the rate base altogether in favor of a return allowance keyed entirely to cost of capital requirements. Catterall would have given the C&P company only 2.7 million dollars instead of 7.2 million dollars allowed by the majority. Judge Catterall gave three reasons for the wide disparity between the small increase he favored and the larger increase actually granted. First of all, Catterall would have used a hypothetical debt ratio of 45 per cent instead of 35 per cent, which the Bell company management insists is safer for the company. Second, Catterall thinks AT&T is earning too much on common stock, which he believed would still be attractive to investors at $12 a share instead of $13 earned in 1956. He would limit AT&T earnings to about 8 per cent on common stock instead of nearly 9 per cent.

Finally, Catterall questioned the standard rate case treatment of Western Electric, suggesting that a proportioned share of Western Electric earnings should be deducted from the system's earnings.

The California Rate Increases

The new rate increases allowed to the Bell and Independent companies in the Los Angeles area are actually the result of rate structure adjustment. The Los Angeles city attorney, Roger Arnebergh, was not pleased. He felt that the rate increases were granted without full hearings of all issues. But in this situation, an appeal to court is unlikely. The reason is that the commission was straightening out some inequities which have crept into the metropolitan area exchange rates.

Under the new order, the four telephone companies serving greater Los Angeles will be enabled to shorten the distance for multi-message unit calls. This will increase monthly bills, especially of those subscribers who make a great many calls. Generally, under the commission order, a call which used to cost two message units now costs three message units.

The commission denied a company request that the message-unit rate for the Southern California region be increased from 4.25 to 4.3 cents.

Still pending before the California commission are other telephone rate increase proposals totaling 28.5 million dollars which would raise basic monthly telephone bills throughout the state by from 5 to 35 cents. A University of Wisconsin economist has been hired by the city of Los Angeles to analyze Pacific Telephone's request for 28.5 million dollars in statewide rate raises.

REA AUTHORIZES FIVE LOANS TOTALING $1,324,000

The Rural Electrification Administration approved telephone loans totaling $1,324,000 during the week of Dec. 16 for five borrowers in Georgia, Minnesota, Oregon, South Dakota and Wisconsin.

The loans will finance initial telephone service for 710 new rural subscribers, improved service for about 2,200 existing subscribers, and other system improvements. Details follow:

Nelson Telephone Cooperative, Durand, Wis.; $238,000, second loan (Dec. 16).

The borrower plans to provide initial service to 50 families and to improve service for 306 existing subscribers. The cooperative expects to serve additional territory, where the existing subscribers now receive magneto service from the Arkansaw (Wis.) Telephone Co., whose facilities the borrower plans to acquire.

A new automatic central office is scheduled at Arkansaw. About 77 miles of the 95 miles of line to be acquired from the Arkansaw company will be rebuilt for use in the expanded system, and the remainder retired. A portion of the loan will be used to complete the authorized system now under way.

The two REA loans, totaling $762,000, will make possible new and improved service to 1,641 rural subscribers through three exchanges. The Durand and Nelson exchanges are scheduled for cut-over within the next few months.

William Weisenbeck is president and Bryon C. Dale is manager of the Nelson Telephone Cooperative.

•

Trenton (Ga.) Telephone Co., $61,000 (Dec. 17).

This loan will furnish initial service for 155 families in the Sand Mountain and Lookout Mountain areas adjacent to the borrower's present Trenton exchange. A portion of the loan funds will also be used to complete the authorized system.

The three automatic exchanges of the system at Rising Fawn, Trenton and West Brow are all in operation and serve over 600 subscribers. When complete, the system will serve 886 rural subscribers.

Jules A. Case is president and W. R. Tatum is manager of the Trenton Telephone Co.

•

Baltic, (S. D.) Cooperative Telephone Co., $116,000, second loan (Dec. 18).

The borrower proposes to improve service for 168 existing subscribers and to furnish initial service to 39 farm families. To accomplish this, the company plans to serve additional territory where the existing subscribers are now receiving magneto service from the Crooks Telephone Co. which plans to abandon its facilities, including a central office, to the borrower.

Rehabilitation scheduled by the borrower in the enlarged service area includes a new automatic central office at Crooks.

Approximately 464 rural subscribers will benefit in new and improved service as a result of the two REA loans, totaling $218,000, to the borrower. The completed system will comprise two exchanges. The Baltic exchange was cut over last July.

Joseph N. Ausan is president of the Baltic cooperative, and Bennie C. Ronsdahl is manager.

•

Sunnyside (Ore.) Telephone Co., $562,000, first loan (Dec. 19).

The new borrower plans to improve service for its 1,111 existing subscribers and 71 switchers, and to serve 358 families in the area now without telephones. At present, the Sunnyside system consists of automatic central offices at Lafayette and Sunnyside, and common battery and magneto switchboards at Damascus and Yamhill. The borrower proposes to acquire from the Pacific Telephone & Telegraph Co. 24 miles of toll line which it will use for local service in the expanded system.

New construction planned will include automatic central offices at Sunnyside and Yamhill. New and expanded automatic facilities will be installed in the present Lafayette building, while subscribers in the Damascus area will be served from the Yamhill exchange. The company expects to retain the headquarters facilities in Sunnyside with minor rehabilitation. The 71 present switchers of the Sunnyside company will continue as switchers in the enlarged system.

Provision is made in this loan to reimburse the borrower for previously authorized construction now underway.

Lambert D. Miller is president and manager of the Sunnyside Telephone Co.

•

Scandia-Marine Telephone Corp., Scandia, Minn.; $347,000, first loan (Dec. 20).

The borrower, recently incorporated, plans to improve service for 569 existing subscribers and to provide initial service for 108 rural families. As a nucleus for the new service, the borrower proposes to acquire the physical properties of the Scandia-Marine Telephone Co., which now provides magneto service over 124 miles of line.

Scheduled new construction includes automatic central offices at Marine and Scandia. The borrower plans service without toll charge between its two exchanges.

Eugene L. Beyl is president and manager of the Scandia-Marine Telephone Corp.

City Attorney Dion Holm announced that Prof. Lionel W. Thatcher has agreed to tackle the job for an $8,000 expert's fee. The fee was approved recently by the board of supervisors after a lengthy fight over protests against the hiring that were raised.

Tax Deferral as an Expense

The regulatory problem of how to treat the so-called tax "savings" which public utility companies may experience through the use of accelerated depreciation continues to bother state commissions. The reason why this problem is so puzzling is the fact that a public utility company would get no benefit whatever from the use of the accelerated depreciation method of computing its tax return, unless the normal amount of tax payment were allowed as an operating expense.

The normal amount of tax would be what a public utility company would have paid under the old system of computing depreciation in equal installments, spread over the life of the property to be depreciated. The difference between the tax actually paid and this normal tax constitutes the so-called "savings" which Congress intended all business taxpayers to use, if they chose to do so, under the Internal Revenue Act of 1954.

Of course, in the final analysis there is no "savings" at all—but only a tax deferral. The taxpayer enjoys the temporary benefit of having more money left in his hands during the earlier years of property life than he would otherwise have if he had paid the normal tax. But, in the long run, he will have to pay more and more taxes during the latter years of the property life, so that the whole thing balances out evenly—assuming that there are no changes in the rate of taxation during the intervening period. As to that possibility, the taxpayer may find himself ahead, if taxes go down eventually. Or he may find himself behind, if the tax rates go up. That is the chance he must take when he elects to use the accelerated depreciation method of computing his deduction.

But there are some commissions which refuse to allow, as an operating expense, any amount of claimed tax payment which has not actually been paid during the year in which it is claimed. If a commission insists on that treatment, you can see that the utility company would not even get a temporary benefit from tax deferral. Such benefit would go to the rate payer. Indeed, the utility company under such circumstances might be better off not claiming accelerated depreciation. At least, the rate structure would not be distorted by irregular deductions over the life of the property which might eventually have to be recouped by rate increases.

Congress did not say, in passing this tax law, that public utility companies —as distinguished from all other business corporations—were to have no benefit from it. On the contrary, the accelerated depreciation provision was inserted in order to make it available to all business taxpayers. The basic idea was to allow funds to remain in the hands of business corporations which could be used for financing the expansion of plant facilities. This, in turn, would make more jobs, more taxable income, and, in the end, everybody would benefit, including the U. S. Treasury. Anyhow, that is the theory of the whole accelerated depreciation program—the stimulation of a dynamically increasing volume of business.

A recent decision of an Indiana circuit court (for Hendricks County) contains some very constructive thinking on this subject. And, because it involves an electric company (and might thereby escape the attention of telephone companies), some mention of the court's ruling might be worth noting here. The case arose when the Indiana Public Service Commission allowed the Public Service Co. of Indiana, Inc., an electric rate increase of $1,718,857. One of the company's main wholesale customers was an REA co-op in Boone County, which appealed the increase as unjustified. The co-op contended, among other things, that the commission should not have allowed the electric company to "normalize" its federal income tax payments. And, here is what the court, in the opinion of Judge George W. Hadley, had to say on that point:

"The apparent purpose of Congress, in permitting accelerated amortization and depreciation of certain facilities over a shorter period than the life of the facility, was to encourage expansion of industrial plant facilities by making available increased accumulations of working capital, resulting from a deferment of federal income tax payments during the years when the accelerated amortization and depreciation of the facility were effective.

"The placing of such tax accumulations as interest-free capital at the disposal of company for limited use effectuates the purpose of Congress; for rate-making purposes, this is accomplished by the allowance of such deferred federal income tax as a charge against net operating income. Such purpose would be thwarted if it were required that such deferred taxes be added to company's earnings.

"It is the conclusion of the court that the allowance of federal income tax deferral by the commission as a charge against operating expense, in computing rate test net income, was lawful; and that the elements included by the commission in its finding of the level of expenses at Dec. 31, 1955, were lawfully allowable in rate-making procedures."

1958 Convention Calendar

Association	*Date*	*City*	*Hotel*
Louisiana	Feb. 12 and 13	New Orleans	Jung
Minnesota	Feb. 17, 18 and 19	St. Paul	St. Paul
Texas	March 3 and 4	Dallas	Baker
Kentucky	March 4	Lexington	Phoenix
Iowa	April 8 and 9	Des Moines	Fort Des Moines
Ohio	April 14, 15 and 16	Columbus	Deshler-Hilton
Nebraska	April 22 and 23	Omaha	Paxton
Indiana	May 7 and 8	Indianapolis	Claypool
American Railroads (Communications Section)	May 13, 14 and 15	Kansas City, Mo.	Muehlebach
Wisconsin	May 14 and 15	Milwaukee	Plankinton House
Illinois	May 21 and 22	Peoria	Pere Marquette
Kansas-Missouri*	May 26 and 27	Kansas City	Town House
Pennsylvania	May 26, 27 and 28	Bedford	Bedford Springs
Maine-New Hampshire-Vermont*	June 3, 4 and 5	Rockland, Maine	Samoset
California	June 4, 5 and 6	San Francisco	Sheraton-Palace
New York	June 16, 17 and 18	Schroon Lake	Scaroon Manor
Oregon-Washington*	June 19, 20 and 21	Portland, Ore.	Multnomah
Michigan	Sept. 9, 10 and 11	Grand Rapids	Pantlind
Arkansas	Sept. 15 and 16	Hot Springs	(Unannounced)
Rocky Mountain	Sept. 17, 18 and 19	Salt Lake City	Utah
USITA Annual convention	Oct. 13, 14 and 15	Chicago	Conrad Hilton
Virginia	Oct. 30 and 31	Roanoke	Roanoke
Oklahoma	Nov. 5 and 6	Oklahoma City	Huckins
Alaska	Nov. 12 and 13	Juneau	Baranof

*Joint Convention

Microwaves for Expansion

By E. A. McKEE SR., E. A. McKEE JR., and T. T. WAGNER JR.

OVER THE past few years the development of radio transmission in the region of the microwave spectrum has advanced with spectacular rapidity. This medium, regarded as impractical not too long ago, has now come of age and the results of the many painstaking years of scientific research are materially shown in the present commercially available microwave equipment. The former black boxes and massive prototype designs have evolved into the attractive, smaller yet sturdy and reliable models of today.

Mass production of microwave equipment for both military and commercial use has brought system costs down considerably. Advanced quality control and field performance data gathering programs have increased system reliability by a factor which previously would have been considered impossible. These reasons, plus the present increased demand for high channel density communication systems, have alerted both management and engineering personnel in the telephone industry that here indeed lies the solution to their growth requirements.

This is all well and good, but we now run into a problem—education. Personnel who for years have dealt only with wire lines and lower frequency radio communication find that many basic questions about this new art present themselves. Both telephone management and engineers have questions pertinent to their use of this medium that must be answered if we are to expect progress. For these are the people who will use microwave as a tool of their trade. So, this article is written to provide concise answers and to acquaint the telephone industry with what may be expected from microwaves.

*E. A. McKee Sr. is Division Plant Manager of the Southeastern Telephone Co.; E. A. McKee Jr. is Chief Engineer of the Central Telephone Co., and Mr. Wagner is Applications Engineer of the Philco Corp.

Theory of Operation

Microwave is inherently simple in both theory and operation. One may be astounded at a statement of this sort, however, from the following paragraphs you will see that amazingly enough it is true. Once we remove the shrouds of darkness which surround this new medium, the understanding becomes easier.

In any communication system we must have both a transmitter and a receiver, no matter which method we choose. A review of radio fundamentals reveals that for any type of transmitter we must have an oscillator, or frequency generating component. The frequency thus generated then passes through a medium and is received by a receiver tuned to the frequency of the generated wave.

For microwave higher frequencies are used, but the principle remains the same. As the transmitting oscillator a reflex Klystron is widely used. This component generates the microwave frequency which is then fed, through the use of a waveguide, to the parabolic antenna where the signal is beamed line of sight to a receiver. The receiving paraboloid picks up the transmitted signal and it is fed through the waveguide to a receiver. A reflex Klystron local oscillator in the receiver beats with the incoming signal in the conventional manner producing a lower frequency IF which may be readily amplified and detected.

Frequency modulation is used to carry the desired intelligence on the microwave carrier. The reflex Klystron transmitting tube has the unique property of changing its frequency of oscillation when different modulating voltages are supplied to its reflector. We are then able to supply the modulating information to the reflector and obtain a frequency modulated output from the Klystron.

As may be seen in *Fig. 1*, the Klystron is both the oscillator and power amplifier tube. In most telephone communication applications, a Klystron is used which has a power output of 1 watt. This appears small in view of the large powers radiated by present low frequency radio systems. But, when we take into account the large antenna gain of the paraboloid and the concentrated beam width, we find that the original 1 watt is multiplied to an effective radiated power of some 3 to 5 KW, depending upon the antenna size used.

Present microwave equipments are divided into two major classifications, terminals and repeaters. Each equipment is capable of duplex operation. The terminal equipments are the frequency standards of the system and are utilized for inserting and dropping out the desired information. The most practical repeater is a true repeater utilizing only two reflex Klystrons and capable of duplex operation. The correct operating frequency of these equipments is controlled by the terminal stations of the system. It is, however, possible to arrange terminal stations in a back-to-back fashion for repeater use.

Fig. 2 shows a typical two-hop microwave relay system utilizing two terminals, one heterodyne repeater and associated equipment. This diagram

also shows frequency separations used, and how duplex operation is derived.

This short discussion has provided only very basic information about microwaves. However, as with all learning it is best, at first, to stick to basic facts and to obtain a good general concept of what is being dscussed. If you will merely remember the basic principals outlined above, further understanding becomes simplicity.

Telephone Application

Microwave would be of little or no use to the telephone industry if we could not provide a method of providing more communication channels than the basic one which is provided by the microwave carrier itself. So, we must find a way of combining a large number of individual communication channels and applying them to the microwave system. This is done with channelizing or multiplexing equipment and is the factor which makes microwave begin to pay off.

A simple analogy may be drawn by using the ordinary telephone pair. In the early days of telephone communications the pair was a limit, i. e., it would carry its own duplex communications, but would allow no others without a complete jumbling of intelligence. As the result of intensified telephone company research, the wire line carrier systems were developed which make possible a number of voice channels on a single toll pair. Continued research and development along these lines has produced the fine high-quality wire line carrier equipment which is found in the central office today.

To pursue the analogy, the basic carrier frequency of the microwave system may be considered as a pair. Then it merely becomes a matter of supplying the proper channelizing equipment to produce the required number of voice channels. This has been done and with present channelizing equipment a multiplicity of channels may be placed on a single microwave carrier.

Two types of channelizing equipment are in general use; these are Frequency Division and Time Division

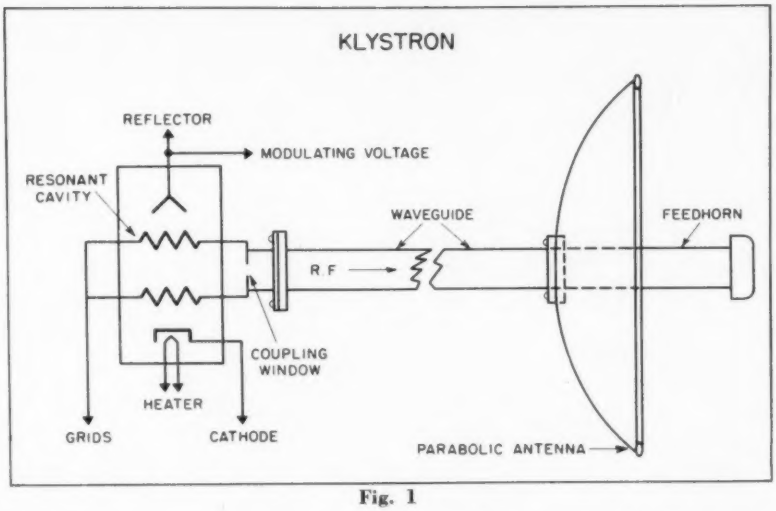


Fig. 1

Systems. The Frequency Division system utilizes a staggered frequency arrangement for deriving each individual voice channel and the Time Division system derives the voice channels by separating them on a time base and utilizing what is known as a sampling rate for each channel. Each system has particular advantages, however, the frequency division method of deriving the communication channels more fully meets telephone requirements. It is readily expandable, capable of high channel densities and provides the quality signal to noise ratio required for toll trunk use.

Microwave toll trunks are of high quality and may be equipped with individual signalling for each channel. They are suitable for inter-toll dialing purposes and may be equipped for all the level and drop specifications of the telephone industry. In short, the present microwave channelizing equipment will do everything and in many cases more than wire line carrier equipment.

Installation Considerations

Before the final decision to install a microwave system, telephone company management must study the requirements fully to decide whether the installation will be a profitable one. Of course, before even thinking of such an endeavor the expansion rate must have been great enough to justify additional toll trunks. Now, management must balance the installation and maintenance cost of a microwave system versus pole line construction in the particular area. It has been found in most cases, depending upon local terrain features, that the installation of a microwave system is the cheaper of the two. However, for some installations existing pole line construction and small channel requirements may make additional wire lines profitable. For high channel density toll systems microwave is usually the most inexpensive and practical means.

As a result of the present lower costs of microwave and the divided payment plans which are available, the amortization rate of microwave equipment also compares favorably with that of other central office equipment. Improved maintenance techniques and standardization of parts has reduced long-term maintenance costs to a minimum. Obsolescence is not a deciding factor of equipment for the microwave spectrum. This fact, coupled with greater equipment reliability, assures management that the equipment which he buys today will be in use and serviceable over a long period of years.

The central office equipment engineer will be vitally concerned with any possible microwave installation. He will be responsible not only for the correct initial installation of the equipment in his plant but also will have to properly maintain it for a number of years. Management will lean toward him for information as to the best type of equipment and will in all probability ask him to perform the initial system layout. So, it is imperative that he familiarize himself with the manufacturers of such equipment for he

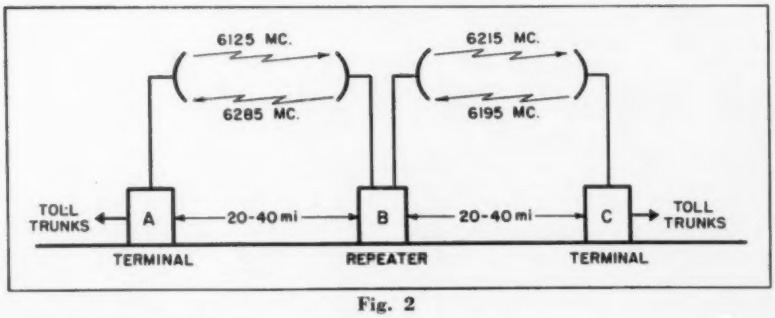
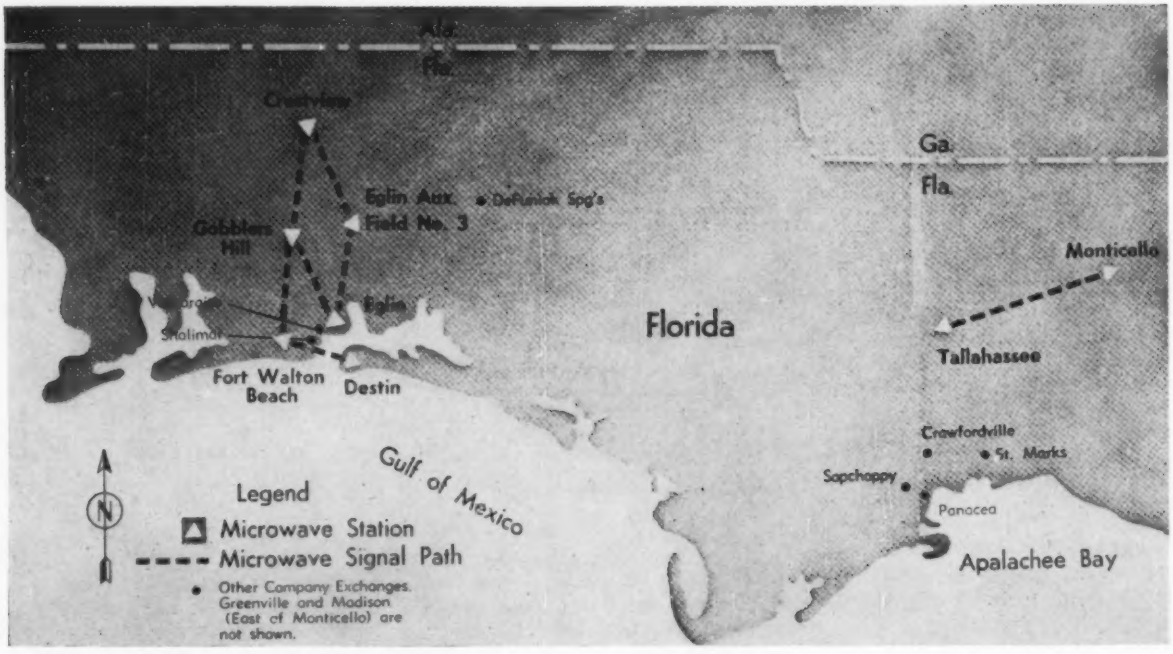


Fig. 2



Map showing presently installed Philco Microwave Systems connecting Southeastern Telephone Co. exchanges.

will have to live with whichever equipment is purchased.

Maintenance men must be trained in the new art and properly licensed as required by the FCC. For the average maintenance man, a second-class radio telephone license is satisfactory but a first-class license is to be desired. The proper licensing of maintenance personnel and the consideration to the purchase of adequate test equipment and spares must be made before the system is purchased. To be negligent in matters such as these results in excessive cost, poor performance and a generally unsatisfactory microwave system.

When management and engineering have considered the facts mentioned above and decide to install a microwave system, then their next step is to submit their specifications to a number of reputable manufacturers for bids. This is not absolutely necessary, but unless a particular manufacturer has proved beyond a doubt that his equipment is right for your application, the bidding procedure is a wise one. Either a complete turnkey or a partial installation contract may be specified. The turnkey installation method is commonly employed for it assures proper system performance and leaves company personnel free to continue their ordinary duties.

When a supplier is decided upon, then filing must be made with the FCC for a station permit and frequency allocation. It is advisable for this procedure that the application be submitted through the company's legal advisor. He may then work in coordination with the chosen manufacturer and the FCC to secure the needed construction permit and station license.

Southeastern's Microwave

Current User. As a practical example of the application of microwave, let's look at the experience of Southeastern Telephone Co. This company serves the northwestern area of Florida including the state capital, Tallahassee (see map). While the telephone plant problems arising in the area can not be termed average, at least with respect to the tremendous population growth experienced, they do present ideal circumstances for use of the microwave medium.

Increased Circuit Demands. Accompanying the population build-up and rapid station growth of the past decade has been the ever-increasing demand for toll service. In 1949, Southeastern had less than 1,700 circuit miles of toll plant. Of that amount, more than 75 per cent was open wire facilities. Five years later, in 1952, the number of circuit miles had doubled with a change to approximately a 50/50 ratio of voice frequency and carrier facilities.

These were the years in which carrier was playing an important role, but it was also to be the real beginning of the microwave era. By 1952, management people in Southeastern were casting about for detailed information on microwave application. Expectations of large group circuit requirements in 1953 and the years following were forcing extensive examination of ways to provide easily expandable facilities at the least possible cost.

Circuit demands actually surpassed expectations and in the three years from 1953 to 1955 the toll plant again doubled. It later became a matter of record looking at the year ending 1956 that circuit milage increased eightfold from the 1947 figure.

The shift in type of facility was also a matter of record. For Southeastern did install multiplexed radio systems in 1955 and 1956. Distribution of circuit mileage by type changed to: 25 per cent open wire, 50 per cent carrier, and 25 per cent multiplexed microwave systems. A trend was established. Open wire and carrier investment was henceforth to grow at a reduced rate while major circuit increases would fall on backbone radio routes.

The First System. Southeastern Telephone Co.'s first serious consideration of the medium of microwave for providing toll grade trunk circuits began in 1953.

All long distance service from a government-owned installation at Eglin Air Force Base was to be moved from the Bell company's toll center at Pensacola to Southeastern's toll center at Crestview. Initially an outlet group of 24 circuits would be needed.

Preliminary studies indicated that wire or carrier circuits could not meet the requirements without considerable

(Please turn to page 26)

A communications utility used its 702 to dig 18,000' a month. One job—opening 2500'—cost one-third of the estimate . . . establishing a new low for underground cable installation.

Now you can place your cable underground at low cost

The many advantages of having electric and telephone cables underground have long been recognized. The chief obstacle has been the cost of digging and backfilling the required trench.

The new Barber-Greene 702 Ditcher has solved this problem. Despite its small size, the 702 is the newest machine in the most rugged line of ditchers made.

Prior to this new development, available machines either dug too wide for practical and economical operation, or did not have the stamina and digability required for coping with unfavorable conditions.

Utilities, contractors and railroads are now gaining the advantages of underground lines and services in virtually every area of the country.

Applications, to date, include electric power and telephone lines and house services, railroad signal systems, traffic control systems, outdoor theater wiring, installations of small gas and water lines and services, lawn sprinkling systems, and others.

Digs to 40" deep, 5" wide. The 702 can be towed or carried on a light truck. Simple dual controls permit operation from seat or from side of machine for full view of trench.

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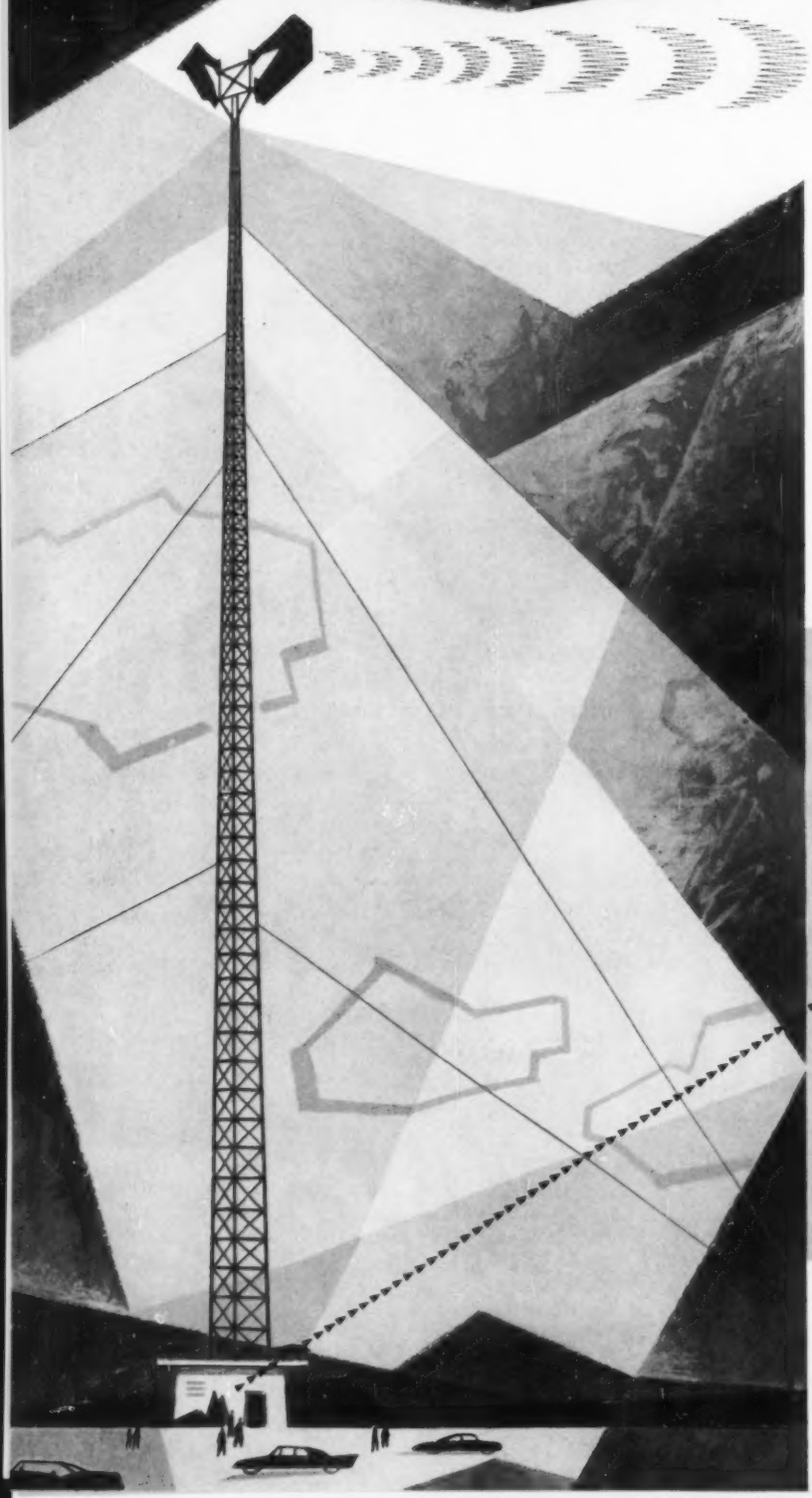
PHILCO *Announces*

NEW CLR-9 HIGH



The CLR-9 terminal consists of wave-guide assemblies, master control, tubeless power supplies and plug-in chassis for IF assembly, baseband drop, modulator, reflector control and servo.

CHANNEL DENSITY MICROWAVE

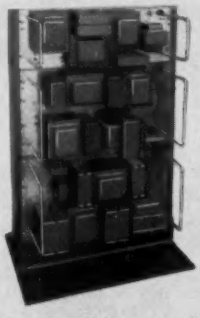
WITH 240 VOICE CHANNEL CAPACITY

Here is high channel density and outstanding reliability of operation—plus individual Automatic Standby for transmitter and receiver. The new Philco CLR-9 Microwave System is designed for quick installation in standard relay racks . . . and engineered with built-in metering and accessibility to all critical test points for easy field maintenance.

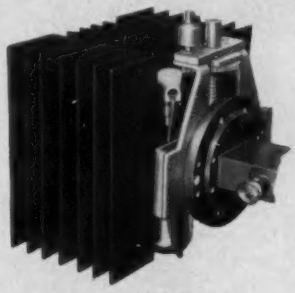
Performance reliability is sharply increased by the use of tubeless power supplies—new semiconductor rectifiers replace tubes. The use of printed wiring panels increases circuit stability—printed circuitry is keyed for easy identification—may be quickly replaced by maintenance personnel (permits efficient, centralized depot maintenance). Klystrons in the new CLR-9 are cooled by convection . . . the use of more compact heat sinks eliminates the need for bulky blowers.

The CLR-9's 240 voice channel capability is maintained even in repeater operation, to provide full duplex transmission and reception in both directions. Integrally mounted standby equipment is included.

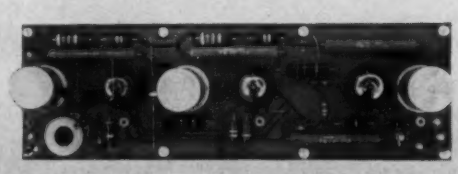
- **A new dimension in communications reliability . . . for continuous unattended operation.**
- **Baseband capacity for 240 channels or more.**
- **Peak performance at moderate cost—power supply capacity sufficient to accommodate both primary and standby equipment.**
- **Duplex transmission of wideband composite multiplex voice signals.**
- **Incorporates new low noise conversion and preamplifier circuitry.**
- **Integrated, fast, automatic standby selection included in one rack with individual back-up for transmitter and receiver functions.**



Heavy-duty, tubeless power supplies increase reliability by employing semiconductor rectifiers —assures maximum reliability and minimum maintenance.



Heat sinks cool the Klystrons by convection—gear drive assembly permits precise Klystron tuning.



Rugged printed wiring panels increase circuit stability and simplify maintenance.

PHILCO. Government & Industrial Division
4702 Wissahickon Ave., Philadelphia 44, Pa.

In Canada: Philco Corporation of Canada Limited, Don Mills, Ontario

LEFT PHOTO: Edward J. Zabelski making tests on receiver and transmitter of Tallahassee microwave equipment. This equipment includes the insertion amplifier and the klystron tube. RIGHT PHOTO: Robert L. Stephenelli examining the wave guide and the wave guide switch.

expense for new construction and retransposition work. Importance was also being placed on the provision of a second route to insure communications out of the area at all times. At the very time engineering conferences were being held to find a solution to the problem, the military was planning a network of on-base microwave communications between their main and auxiliary fields. Subsequent conferences between the military and the telephone company revealed proposed air force radio equipment and tower sites could readily be integrated into an Eglin-Crestview microwave toll route.

Arrangements were made for establishing a jointly owned and maintained system; and due consideration of the Air Force's experience and pre-established microwave plans resulted in a choice of Philco CLR-7 radio relay units with CMT-4 time division multiplex equipment for providing the service. To insure the utmost in reliability full standby radio and power units were included in the installation.

Final path clearance surveys led to the construction of a self-supporting 85-foot tower at Crestview to provide line of sight transmission to Eglin's Field No. 3 repeater point and thence to the terminal location at the main base.

Thus Southeastern's first microwave system came into being early in 1955. A difficult service problem was met with an economical solution and at the same time a test system was established from which experience could be gained for making decisions in future microwave applications.

Additional Systems. In a little over a year following the completion of the Eglin system, a second route was established from Crestview to the company's Ft. Walton Beach exchange, 25 air-line miles south of the toll center. Initially, the Crestview-Ft. Walton Beach system was to supplement the pole line circuits and was equipped with only 24 channels.

As in the Eglin system, Philco CLR-7 radio units were used with band assignments in the 5925-6425 megacycle range. In this installation, however, Lenkurt 45BX multiplex equipment was furnished to permit easy expansion of channelizing for satisfying 10-year projected requirements of more than 100 circuits.

While normally the route distance experienced in the Ft. Walton Beach system could be met without repeaters, tower costs that would have been involved at the terminal points resulted in the decision to establish a two-hop system. Reflectors mounted on the 85-foot tower at Crestview provided proper path clearance to a 200-foot guyed tower at the repeater point and then the required clearance to Ft. Walton Beach was met with the construction of an 80-foot "H" pole fixture.

During 1956, the same year the Crestview-Ft. Walton Beach system was established, another microwave link was being installed between Southeastern's toll center at Tallahassee and their exchange at Monticello, a connecting point to Southern Bell facilities.

Preferring continued operation in the 6,000-megacycle band and to benefit fully from maintenance experience on the Crestview system, this third installation was again made with Philco CLR-7 radio equipment. But in this case still a different type of multiplex equipment was needed. Matching and interconnecting with Bell company "O" carrier assignments initially required the use of 24 channels of Western Electric type "ON" equipment. While this type of channelizing was limited to 40-48 circuits per "RF" assignment, multiple parallel paths were planned for fulfilling long-range circuit projections.

The Tallahassee-Monticello link consisted of the two terminals covering approximately 24 miles. Clear path transmission called for the construction of 180 and 200-foot towers at Tallahassee and Monticello, respectively. In each instance, comparison of higher investment in self-supporting structures versus lower priced guyed towers with extra cost of land, central office to site interconnection, and maintenance proved that self-supporting towers at the central office locations were the proper economic choice.

Here, then, was Southeastern's microwave picture at the end of 1956.

Main toll leads were supplemented with three separate radio systems and provision was made for rapid circuit build-up.

What about the future growth? Firm plans and partially completed additions in each of Southeastern's microwave areas in 1957, alone, will increase radio derived circuits from 72 to 152. Projections indicate the need of more than 280 circuits by 1960. With this type of growth, microwave proves to be extremely practical; for circuit cost per mile drops rapidly as the common tower and radio expenses can be spread.

Comparison of Costs. Engineering economy in the choice of any type of plant demands that a comparison be made of all reasonable methods of providing the service.

The increase of material and labor cost for providing wire toll circuits, coupled with the decreases in cost of microwave and multiplex equipment, is making the medium of microwave more attractive each year. And, it is already a fact that after towers and RF equipment have been established for a system, the cost of adding channelizing will be no more than adding long line wire carrier equipment on a per channel basis.

But what are some of the figures in comparison? Perhaps the industry's most representative problem can be found in an example situation of open wire and carrier versus multiplexed radio.

Southeastern Telephone Co. building in Tallahassee with micro-wave tower in background.

For the comparison we shall use the figure of $3,800 per mile for a toll lead consisting of four "150 KC" transposed wire pairs. Under maximum application the four-wire pairs will provide for 60 carrier and four physical circuits. The cost of a 25-mile section of such a pole line would amount to approximately $95,000, and the provision of the 60 channels of carrier would add an estimated $160,000, for a total in-place-cost of $255,000 for the 64 circuits. Thus the average cost per circuit would be $3,984 for the 25-mile section or about $159 per circuit mile.

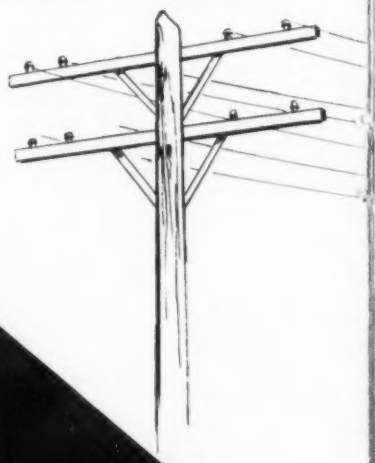
Look back at the figure of $95,000 covering the investment of toll pole line only. This is the important figure for first cost comparison. Against it we must consider costs of RF equipment, towers, antenna systems, and emergency power plants; all of which are necessary in establishing the microwave path.

Let's assume we use the newer high density systems with channel capacity of 240 circuits, and an average single hop path of 25 miles. We shall plan on each terminal point requiring towers of 150 to 200 feet, sufficient in strength to withstand maximum storm conditions encountered in the area. Where ample land is available guyed towers may be used reducing tower costs to as much as one third of the cost of self-supporting structures. In this instance, however, we will use average costs of $25,000 each for self-supporting towers. The RF terminals installed will be an estimated $11,000 each, emergency power plants $3,000 each, and antenna systems at about $6,000 for each terminal. We must also allow for spare parts and test equipment to maintain the system, and for this we would include $6,000. Totaling these items, we

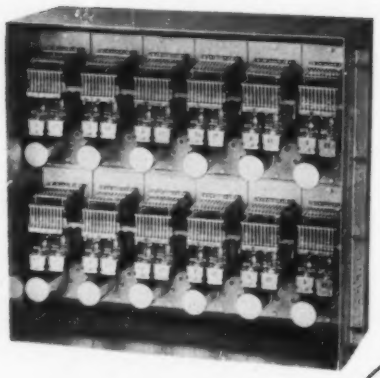
(Please turn to page 56)

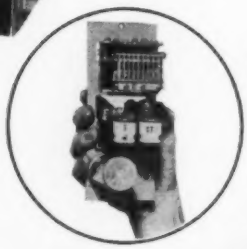
"H" fixture being used for micro-wave tower near telephone building at Ft. Walton Beach.

For *Modern* Party Line Operation →



Typical relay case
for Ringing Converter





Relative size of
unit assembly of
Ringing Converter

The UNIVERSAL
Code-to-Selective Ringing
Converter employs
simple circuits with the
magnetic impulse counter,
together with other
standard relay apparatus
of recognized
manufacture.

Other UNIVERSAL Telephone Equipment:
UNIVERSAL COMPUTER INTERCEPT
DIGIT ABSORBER for 2-5 Numbering

INDEPENDENT

"EASY TO INSTALL" UNIVERSAL RINGING CONVERTER!*

MODERN SERVICE DEMANDS SELECTIVE RINGING

Selective ringing has become a "must" to maintain customer relations, but the cost of modification of earlier dial units to full selective ringing is often excessive . . . in material, engineering and especially for the installation. The UNIVERSAL Code-to-Selective Ringing Converter unit is a simple applique circuit which places the majority of the wiring modification on a factory basis, thus reducing the installation time to a minimum. Most installations can be performed by maintenance personnel. Your company will benefit from increased revenue that can be expected with selective ringing because of increased station rates and increased party line fill.

*Pat. Pend.

TELEPHONE DIVISION

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CONTROLS CORPORATION
OFFICE AND PLANT – CARROLLTON, TEXAS
MAIL ADDRESS – P. O. BOX 13122, DALLAS 20, TEXAS

KELLOGG
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SALES OFFICES

5924 S. PULASKI RD.
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1515 TURTLE CREEK BLVD.
DALLAS 7, TEXAS

4501 TRUMAN ROAD
KANSAS CITY 1, MO.

1555 WEST FOURTH STREET
MANSFIELD, OHIO

23 BRODERICK ROAD
BURLINGAME, CALIF.

1594 SOUTHLAND CIRCLE, N. W.
ATLANTA, GA.

6100 EXCELSIOR BLVD.
MINNEAPOLIS 16, MINN.

165 PROSPECT STREET
PASSAIC, N. J.

Mail this coupon to the nearest address.

Gentlemen: I am interested in your Universal RINGING CONVERTER

Name_____

Position_____

Firm_____

Address_____

City_____ State_____

T-1-11

THE Plant Man's Notebook

BY RAY BLAIN, TECHNICAL EDITORIAL DIRECTOR

AN ARTICLE titled: "Why Can't I Have a Private Line?", by Jack J. Caldwell, customer service supervisor at Lincoln, Neb., and published in the *Lincoln Telephone News*, comments on held orders for his company.

Mr. Caldwell states that "probably the one service in the highest demand bracket, year after year, is the residence private line." As of November 1957 there were 526 Lincoln subscribers waiting for their residence private line. The Lincoln company's situation in this connection is representative we believe of the general condition throughout the country.

Mr. Caldwell states that when the original feeder cables were placed—many years ago—telephone saturation and future demands were estimated on the basis of past experience. The cables were of sufficient capacity to allow for growth under conditions thought to be normal and permanent.

This worked out fine until the mid-forties when almost overnight, there came a surge of housing development and an equal surge in the demand for telephone service—not only in outlying areas, but within the city proper, where big, old houses were being converted into apartments and new homes appeared by the hundreds in former vacant tracts.

The main feeder cables that served those areas were soon filled to their complement. Relief could only be obtained by their replacement with larger cables all the way from the central office.

There was no precedent for this turn of events—duplicated on a nation-wide basis. Telephone companies and suppliers were caught short.

Orders for cable and equipment could not be filled for months and often, when received and installed, were already rendered insufficient to serve the purpose for which they were ordered. Thus, many newer cables were dangerously filled even when they were first placed in service. The backlog of held orders for primary service and private lines grew and grew.

The urban system of the Lincoln company hasn't yet recovered from the impact of this spectacular, unforeseen growth. Many feeder cables are still being replaced, mainly to provide facilities to mushrooming housing developments at the edge of town. As this is done, the congested regions nearer the central office are given relief in the form of additional conductors assigned to their localities.

There is not much doubt that the demand for individual line service will continue and even increase throughout the country for many years into the future. Even though the demand for primary or new service may taper off, it is most certain that a requirement for individual lines in residences will continue to increase.

Party line service, never popular, is just not adequate today in the average residence where the telephone usage is high. People of this day and age are too impatient to wait their turn in sharing a line with others.

It would appear that the "Concentrator" might be used to advantage in the provision of this up-grading of service in many areas. While it is true that there is no substitute for exchange distribution cable, it would seem that perhaps the "concentrator" might be used as a means of solving the problem in certain sections until such time as the cable system can be expanded to meet our modern telephone needs.

•

A new safety boot, designed to keep workers' feet warm and dry in the most severe weather should prove exceptionally popular for linemen. Not only is this boot completely insulated against freezing temperatures, but the upper leather is Sylflex tanned to prevent water penetration.

All stitching holes are sealed with a weather-proofing compound and a steel safety toe is provided.

•

We have a letter from E. W. Ford, district plant superintendent of the California Interstate Telephone Co., at Ridgecrest, Cal., in which he comments as follows on our invitation for expression of opinions on the use of soldered instead of wiped sleeves on lead cables:

"I would like to say that we have been using this method for the last four or five years and we have had very few bad ones turn up. Another thing to consider is that this method eliminates the work of a splicer's helper preparing the lead and passing it up to the splicer. This is time consuming and also dangerous work.

"Another aid to telephone companies desiring to speed up their splicing time is the use of trucks equipped with hydraulic and electric-operated ladders. We have purchased two of these trucks and the use of a splicer's platform is seldom required. In a matter of seconds the ladder is raised and in position. They will also pay off in cable inspection work and trouble shooting.

"I am of the opinion that in the not-too-distant future, the cable splicer's helper will be non-existent. The modern methods we have will eliminate him."

•

Coordination has been defined as action to keep two people apart who have been hired to work together.

Correction

The Plant Man's Quiz appearing in the Dec. 14 TELEPHONY, page 24, included a question about "whether it will be necessary to provide lightning protection for carrier systems." Of the two purposes given for lightning protection, the first should have read:

"To *reduce*, as far as practicable, electrical shock hazards to the subscribers and to the personnel engaged in installation, maintenance and operation of the system."

SUPERIOR CABLES

Better communication cables . . . completely insulated and sheathed in modern plastics!

TEL-C

For all aerial and duct use. Meets REA Spec. PE 14. 6 to 909 prs. 24 and 22 ga. 6 to 404 pr. 19 ga. Quadded or composite.

TEL-CA

For aerial, duct or direct burial installation. Extra mechanical protection. 11 to 202 prs., 24, 22 and 19 ga. Quadded or composite.

TOLL

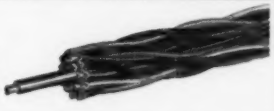
Available in pairs, quads and in composite with regular exchange area cables. Meets rigid electrical requirements needed for toll service. Conductors meet ASTM B-3.

RDC

For extension of service in rural areas where long runs are required. Color-coded. High strength steel support wire. 1-16 prs.

UDC

For short run installation where demand for service is high, low-cost construction is required. Self-supporting. Color-coded. 6 or 16 pr. 24 ga.



COMPOSITE

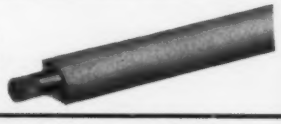
Complements of different gauges provided under one sheath to meet engineering requirements. Same high standards maintained.

INTERCOM

Inside wiring cable, multiple conductor paired. Fully color-coded for intercommunication, inside telephone, sound systems. Special vinyl jacket.

QRC

Quarter-round shaped jacket in choice six std. colors. For use in offices, hotels, etc., for intercommunicating and sound-systems. Up to 51 prs. Features neat, quick, easy installation.

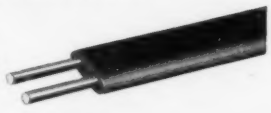


INSIDE TELEPHONE WIRES & CABLES

For inside buildings to extend circuits from outside terminating devices to station sets. Jacketed inside-outside wire. Duct wire (twisted). Flat web type. Jumper wire. Distributing frame wire. Ground wire.

PLW .083S

.083 inch galvanized special steel wire conductors. Insulated in parallel with high molecular weight polyethylene. Self-supporting.

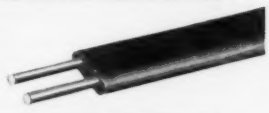


PLW 214 CW

14 gauge solid copperweld conductors. Same insulation as PLW .083S to meet very rigid electrical standards. Self-supporting.

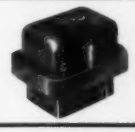
PLW 212 CW

12 gauge solid copperweld conductors. Same insulation as PLW 214CW. Self-supporting. All PLW types for long drop runs at minimum cost.



PLWT 1 - PLWT 2

Terminal is self-supporting on line wire. Simplifies drop-line connections. Provides continuous positive contact. Use with Superior PLW.



DB 217S

Direct burial wire, spiraled flat steel strip shield for maximum resistance to damage from road or farm machinery and equipment.

DB 217B

Direct burial wire, longitudinal bronze shield to resist damage from insects and rodents. Also use in areas conducive to lightning activity.

DB 217

Non-armored type wire for uses in areas where conditions are normal. All DB wire available with 17 or 16 ga. conductors.

"B" SERVICE WIRE

For direct burial use. Resists physical damage. Excellent protection against lightning. 2 pr. 20 ga. copperweld conductors. 40% conductivity. Color-coded.

"SUPER-SPLICE"®

Splice sleeve with one end sealed. Filled with insulating and water-proofing material. Use to keep splices waterproof. REA standard.

INDEPENDENT

For detailed specifications, write

SUPERIOR CABLE

SUPERIOR CABLE CORPORATION • Hickory, North Carolina

TELEPHONY'S Traffic Engineering Handbook

By Gilbert R. Brackett

Jan. 11, 1958

Section 10
Equipment Nomenclature

In some instances, the terms shown in the following list, name equipment arrangements according to particular features of operation. Such terms must at times be combined with other like terms to completely identify the arrangement in question.

Terms change from time to time. When this occurs, the new term will usually become effective at once and will appear on new drawings and new issues of descriptive matter.

Following are the most common terms in use. Most refer to automatic equipment, some are more general, and a few refer to equipment or operations foreign to dial.

General Terms

MANUAL TELEPHONE SYSTEM OR MANUAL SYSTEM. A telephone system in which telephone connections between customers are established manually by telephone operators in accordance with orders given verbally by the calling party.

DIAL TELEPHONE (AUTOMATIC) SYSTEM OR DIAL (AUTOMATIC) SYSTEM. A telephone system in which telephone connections between customers are established by electrical and mechanical apparatus controlled by the calling party.

PANEL DIAL SYSTEM. A type of dial telephone system in which the switching apparatus is generally characterized by the following features: (1) The contacts on the multiple banks over which selection occurs are mounted vertically in flat rectangular panels; (2) the brushes of the selecting mechanisms are raised or lowered by motor driven apparatus; (3) the dial pulses are received and stored by controlling mechanisms which govern the subsequent operations necessary in establishing a telephone connection.

STEP-BY-STEP DIAL SYSTEM. A type of dial telephone system in which the switching apparatus is generally characterized by the following features: (1) The wipers of the selector mechanisms are moved vertically and in horizontal circular arcs; (2) the selecting mechanisms are individually driven by a combination of electromagnet and ratchet mechanisms; (3) the dial pulses may actuate either the successive selecting mechanisms directly or may be received and stored by controlling mechanisms which in turn actuate the selecting mechanisms by pulses similar to dial pulses.

CENTRAL OFFICE. A switching unit in a telephone system providing service to the general public, having the necessary equipment and operating arrangements for terminating and interconnecting lines and trunks. The term "central office" applies to each unit of equipment having a separate office name or code and in addition having independent incoming trunks and terminating switching equipment.

LOCAL CENTRAL OFFICE (LOCAL OFFICE). A central office serving primarily as a place for terminating subscriber's lines and providing service to the subscribers on these lines. A local central office may serve some subscribers on a theoretical office basis with additional office names or codes and, in this case, for commercial or other reasons, some separate incoming trunk groups may be provided for the traffic to these subscribers. The theoretical office arrangement is not, however, considered as a separate central office.

TANDEM CENTRAL OFFICE (TANDEM OFFICE). A central office used primarily as an intermediate switching point for traffic between other central offices. Unless qualified by a prefix or other explanation, this term is restricted by usage to an office employed primarily for the interconnection of local central offices.

PANEL TANDEM OFFICE. Panel tandem offices are of two general types: (1) Sender tandem—tandem and completing office selections are controlled by a sender in the tandem office. This sender gets its setting either from a tandem operator's keyset (Operator tandem) or from another office in the form of pulses (Full selector tendem); (2) office selector tandem—a group of distant office selectors controlled from the originating office or from a sender tandem.

TOLL CENTRAL OFFICE (TOLL OFFICE). A central office used primarily for completing and supervising toll calls.

DIAL SYSTEM OFFICE (DIAL OFFICE). A central office furnishing dial service.

DIAL SYSTEM TANDEM OFFICE. A tandem office employing mechanical switching equipment. The switching operation may be controlled by operators in the tandem office (Operator tandem), or may be entirely mechanical (Full selector tandem). The tandem office may employ either or both of these methods of operation.

STEP-BY-STEP OFFICE. A dial system office where the switching apparatus is of the step-by-step type.

STEP-BY-STEP TANDEM OFFICE. The step-by-step tandem offices are of the full selector tandem type.

COMMUNITY DIAL OFFICE (CDO). A dial office of comparatively small size which serves a separate exchange area having its own numbering plan and which has no operating or maintenance forces located in its own building.

EXCHANGE. A unit of a communication company for the administration of communication service in a specified area which usually embraces a city, town or village and its environs. It consists of one or more central offices together with the associated plant used in furnishing communication service in that area.

OPERATOR OFFICE. A central office which serves as the operating center for assistance traffic for a community dial office.

(Section 10 will be continued next week)

Officers and directors of Florida Telephone Association. Back row, left to right: J. N. Johnson of Ft. Myers; Carl D. Brorein Jr. of Tampa; M. L. Barre of Jacksonville; Max Wettstein of Ocala; Blair C. Stone of Tallahassee, and Otto Wettstein III of Live Oak. Middle row, left to right: Hugh C. Macfarlane of Tampa; Paul Brannen of Ft. Myers; J. K. Galloway of Winter Park; R. W. Shriner, Carl D. Brorein, Ralph Maner, all of Tampa. Front row, left to right: Ernest Menendez of Tallahassee; Mitchell Drew of Quincy; Josephine Poppleton of Tampa; J. L. Sharit of Port St. Joe, and Fred S. McGehee of Marianna.

Florida Companies Face Big Expansion

By R. C. RENO

FLORIDA telephone men and women attending the 50th annual convention of the Florida Telephone Association were given a vivid account of the challenges facing their companies in providing service to take care of the phenomenal future growth forecast for the state during the next decade.

The convention was held on Dec. 2 and 3 in Miami Beach and was presided over by Association President Mitchell N. Drew, general manager of the Quincy (Fla.) Telephone Co.

The first speaker on the convention program, J. G. Bradbury of Atlanta, Ga., executive vice president of Southern Bell Telephone & Telegraph Co., presented telephone station statistics giving an indication of the past population growth of Florida, as follows:

"In 1907, the year the Florida Telephone Association was formed, there were 17,500 telephones in the state, 3,000 of which were Bell-operated and 14,500 were served by Independent companies. On January 1, 1900, there were 6,285 telephones in the state, of which 1,884 were Bell and 4,401 were Independent. At the end of this month, December 1957, there will be 1½ million stations in service in Florida."

Mr. Bradbury also recalled that in 1935 there were only 92,000 telephones in Florida, compared to the 1½ million today. He called attention to the prediction that within 10 years, the number of households in the state will increase 50 per cent—from 1,192,000 to 1,796,000; also that the income per family will increase by 25 per cent, pointing to more and more demands for telephone service. He continued:

"No longer is Florida's economy tied largely to the tourist trade. It has a solid foundation on which to advance.

"Here in Florida we find good roads; we find good over-all transportation facilities. We find good communications service. We find many important ports and harbors. We find Florida is becoming increasingly important from a military standpoint. We find the state's educational opportunities are improving. We find that in industry the people of Florida have the know-how to do a good job.

"To these things can be added the fact that, in contrast to all other states in the Southeast, where during the past five years net migration loss in population amounted to 1½ million people, Florida's net migration gain during the same time has been in excess of 800,000 people."

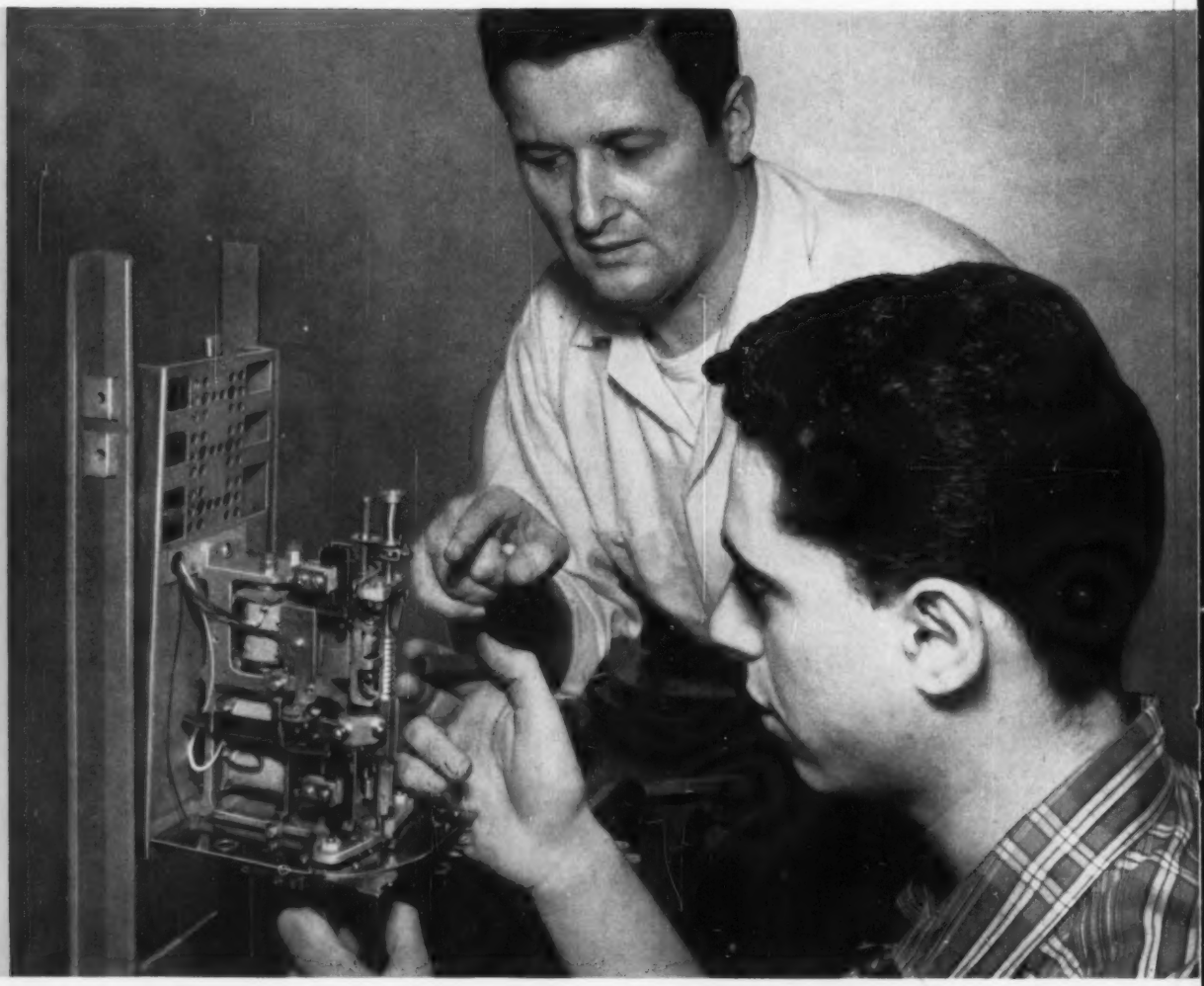
In reviewing the "jobs ahead" for telephone management and employes in meeting the future telephone service demand, Mr. Bradbury listed the following challenges which, he said, face telephone people in any state or community experiencing unprecedented growth:

(1) Being flexible in thinking in order to keep up with rapidly changing developments. Policies must be shaped

(Please turn to page 36)

QUALITY CONSTRUCTION...

Telephone



Skilled craftsmen assemble a Strowger switch.

another reason why Men Choose Strowger!

Quality construction is an important factor to the man who is selecting central office equipment. That's why so many telephone men have toured Automatic's new factory at Northlake, Illinois, to watch the entire manufacturing process of Strowger equipment. They've seen how raw materials are carefully inspected for quality. They've observed the close tolerances to which each Strowger part is manufactured to insure ease of adjustment. They've watched the accurate control that is applied in the plating of Strowger parts to provide good fit and lifetime protection. And, they've noted the constant inspection of these parts during every stage of production. No wonder so many telephone men choose Strowger!

FIND OUT FOR YOURSELF! The next time you're in the Chicago area, come and visit with us. We'll be glad to show you through our entire Northlake plant. You'll see the unsurpassed quality and craftsmanship in the construction of Strowger. Just let us know when you plan to be here so that we may arrange for your tour. *Write Automatic Electric Sales Corporation, Northlake, Illinois. Or, call Fillmore 5-7111.*

AUTOMATIC ELECTRIC

A member of the General Telephone System – One of America's great communications systems

GENERAL TELEPHONE SYSTEM

to meet both immediate and long-range problems.

(2) Maintaining and expanding work in research, because through research comes new and improved instrumentalities to bring about economy in operations.

(3) Keeping telephone people abreast of new developments so that engineering, installations, maintenance and operation of telephone plant may be done properly.

(4) Bringing the right people into the telephone business—those people who have potential to grow with the business.

(5) Convincing all interested parties that commercial telephone companies can furnish better and, in the long-run, more economical telephone service than any non-communication company that might want to get into "our kind of business."

(6) Protecting essential telephone service because the safety and security of our nation could well depend on the kind and quality of service telephone companies give.

(7) Getting public and political recognition of the fact that telephone companies are public servants and that they must be maintained in a healthy financial condition if they are to adequately serve the public.

(8) Developing in telephone people the desire to do a good job and the willingness to deliver a full day's work for a full day's pay.

William J. Clapp, president of the Florida Power Corp., and a member of the Florida Development Commission, spoke on the subject, "Florida's Future."

He credited the private enterprise system and the civic activities of business men for the growth of Florida. He said.

"In every type of civic work you have engaged in, and certainly you contrast those in some other utility services that aren't privately owned, you can see that part of the reason for the progress that has been made in the state, has been private enterprise as practiced so well by the telephone industry of Florida.

"Where would your industry, or the industry that I work with, be today if we had been government owned. How would a government operate a telephone system for the state as a whole, raise the millions of dollars that you have had to raise and do the job you have had to do to keep up the phenomenal growth of Florida."

For Florida's growth, Mr. Clapp gave the following reasons:

(1) Increasing investment in the state by new and old businesses.

(2) New house construction. While for the first six months of 1957, dwelling unit permits for the nation as a whole were down 17 per cent from the same corresponding period in 1956, Florida had an increase of 7 per cent. This is a larger increase than any state had, except California.

(3) New business incorporations and failures. For the nine months preceding last December, Florida ranked third in all states in new incorporations with 7,600, exceeded only by New York State and California. Florida ranked 11th in the number of business failures, with 271—a ratio of 4 per cent to new incorporations. In New York State and California, the ratio of failures to new incorporations were 10 per cent and 17 per cent, respectively.

(4) Increased population. By 1970, the Bureau of Census states that Florida will be the ninth largest state in population; of the 12 largest states by 1970, Florida's population gain will be the greatest, estimated at 65 per cent.

(5) Transportation facilities. In addition to commercial facilities, Florida will have some 1,100 miles of four-lane highways as a part of the federal highway program.

Four of the speakers who addressed the Florida convention. Left to right: W. J. Clapp, president of Florida Power Corp.; J. G. Bradbury, executive vice president of Southern Bell Telephone & Telegraph Co.; W. M. Drew, Florida association president, and C. D. Brorein, president of Peninsular Telephone Co. The Florida association celebrated its 50th anniversary during the convention, which this year was held in Miami Beach.

"When Telephone People Meet Together" was the title of an address by Carl D. Brorein of Tampa, Fla., president of the Peninsular Telephone Co.

"I have long felt that telephone people have a particular appreciation for meetings of this kind. These are opportunities to exchange ideas, face to face. And did you ever stop to think that a mutual exchange of personal ideas, and human intelligence generally —whether of a social or business nature—is the very basis of the telephone business? When telephone people get together, therefore, they do so with a sense of the importance and satisfaction of living, spontaneous contact with our friends," Mr. Brorein said. He continued:

"The telephone, after all, is primarily a *social* means of communication, in the sense that it requires an active personal response from all those who use it. And whether it is being used for business or pleasure—for serious or recreational purposes—the telephone is essentially a bridge across space and distances which links *people*—living personalities. It is not simply an electronic connection between those who are dispatching messages and those who are supposed to receive them.

"Nor is it merely a device for transmitting sounds from one place to another, such as a radio or television broadcast program. The telephone requires, and gets, active and interested participation. It brings us happy news, and sad news, pleasant visits and necessary business conversations. But, whatever it brings us, it addresses us as *persons*, as individuals, just as we expect to talk to persons and individuals at the other end of the telephone wire.

"From time immemorial, the exchange of human intelligence, whether by word of mouth or written document, could move no faster than the physical transportation of the person who carried the message. A lot of ingenuity was employed to break the physical barrier. These attempts ranged from the old smoke signals which were supposed to have announced the fall of Troy over a thousand years before Christ, right down to the homing pigeons which brought the news of Napoleon's defeat at Waterloo across the English Channel in 1815.

"And it was not until Morse's magnetic telegraph, first demonstrated in 1846, that this physical barrier was breached in a limited way. Yet, even the telegraph was no substitute for personal two-way exchange of intelligence. . . .

"It remained for the telephone patented by Dr. Alexander Graham Bell in 1876, to release human communication, forever and completely, from the physical barrier of message transportation. It was the telephone which placed human voice communications on a completely two-way, simultaneous and confidential basis."

Speaking of the importance of tele-

phone service in American life, Mr. Brorein stated:

"We must keep our telephone service modern, adequate, and available to the public in every way possible. As telephone people—men and women—this is our special responsibility and we cannot delegate it. The public looks to us to continue this essential service on the extremely high plane to which it has been elevated by those who have gone before us in this industry. . . . We cannot expect any agency of government or a regulatory commission to share this responsibility. We know what needs to be done and it is our duty to get it done.

"Not the least part of this responsibility is to see to it that our service is strong financially as well as technically. The American public deserves the best and we cannot afford to give the public anything but the best.

"A strong company with good earnings is necessary to provide the proper kind of service. Only then can it expand its services promptly to meet the demand. Only then can it improve its facilities to provide the latest and best quality of service. Only then can it offer new types of services as they are developed.

"A telephone company with good earnings can undertake projects which will, in the long-run, result in better service at lower cost, even though they may in the beginning put pressure on earnings because of high first cost. A company that is kept on a starvation rate cannot do these things. The end result of keeping rates at a bare bones, lowest possible, level would be poorer service at higher cost than would be obtained if the company were allowed to achieve good but fair earnings. Now, these truths are elementary to us. We know them, but there are others who do not know them, or do not realize their importance. To them we have the responsibility of passing on these truths, of convincing them of what is necessary for the public's own good."

Referring to efforts of non-communication companies to furnish communications service, Mr. Brorein warned that the telephone industry must be constantly on its guard to see that its outer limits are expanded in proportion to technical improvement. The industry should not let anybody take its job away from it—even the smallest part of that job, Mr. Brorein said. He went on:

"There are some people today, who are probably sincere and justified in their own minds, who feel, for example, that the telephone industry as such should be ousted or barred from participating in certain forms of mobile radio telephone. There are those who think that the telephone companies should be kept out, or limited, with respect to the use of certain microwave radio frequencies.

"We do not agree to that view. And, our national association is even now fighting that out on the regulatory level before the Federal Communications Commission. But I mention this only because it is just typical of the difficult questions and issues which we can expect to encounter as the telephone art expands its horizons, with the discovery of vast new techniques and improved facilities.

"I emphasized a minute ago the importance of the telephone industry as a two-way confidential form of voice communication. *That* is the service which has been placed in our trust, and we must never consider or concede the proposition that there may be forms of two-way voice communication, conducted as a public business which does *not* belong to the telephone industry. This is an expanding concept. It should be and it must be an expanding concept. As radio and microwave and other techniques, some perhaps not even in existence at the present time, become available, it is our right and our duty, as custodian of a great industry, to use these new instruments. They become a proper part of fulfilling our public service obligations. Our use of them must not be restricted."

In an address entitled "The Rocket's Red Glare," Donald C. Power of New York City, president of General Telephone Corp., said he was moved to recall this thrilling passage from "The Star Spangled Banner" by the anxious situation in which the free world finds itself today, with particular emphasis to "that part of the free world which you and I inhabit—the business world, the telephone business world."

"We live today in a world which has been plunged, almost overnight, into a period of urgent tension. Most of the things which we stand for, the things we value—our traditions, our beliefs, our culture and institutions—have been challenged by the brutal system of Red Communism. Our American way of life is being weighed in the balance. The whole world is watching us with anxious eyes, wondering what we will do, how we will meet this challenge. Is our system as good as we say it is? Will it emerge triumphant from this contest with monopolistic dictatorship?

"If these questions seem to pose the issue somewhat dramatically, it is not due, I assure you, to any desire to exaggerate or overstate. What it all comes down to in plain words, for people such as ourselves in the telephone business or any other business, is that we face a serious test. On our ability to perform and deliver, each in our own appointed sphere of activity, will depend very much what the answer will be when the dawn's early light breaks through again," Mr. Power said.

He referred to serious problems that have risen and been solved by the telephone industry in the past and expressed confidence that the industry will work out solutions to today's problems and those of the future. He continued:

"Before referring to these present-day problems and why I believe we are going to whip them, I would like to make one general observation about problems. That is, we have to have problems in order to succeed. Did you ever think of that? Every important advance, every major discovery in human experience was the result of a problem or difficulty of some kind. People who are perfectly satisfied with what they have, or who are complacent about the way things are, do not have to solve problems. They do not make much observable progress, either, until they become dissatisfied. . . . It is only when we look upon difficulty as a challenge or even as an opportunity that progress is made. *And, it might even be said that if necessity is the mother of invention, then surely crisis is the father of opportunity. . . .*

"And, it is entirely possible that there are opportunities which abound today just waiting to be discovered and realized in every line of business, including our own telephone business. . . . What is opportunity, after all, except a sensible analysis of what can be done, a sound plan for doing it, and a will to do it."

Referring to the way the telephone industry has had to raise its sights constantly since the end of World War II, with respect to what it considers standard adequate and modern service, Mr. Power said:

"This dynamic growth of our country and the accelerated demand for telephone service which lies ahead will, of course, tax the best efforts and all the resources of our Independent companies. That will be partly because it is in Independent territory that a proportion of growth will be the greatest.

"Therein lies a whole cluster of problems like thorns around the rose. But it is a poor rose, indeed, which is not worthy of its thorns. Raising new capital, obtaining rates which will be commensurate with almost constant inflationary rises in prices and operating costs are the two main problems in this area. And, on top of this, there is the bugaboo of taxes which has been made more threatening by the present international uncertainties and the probable rising costs of our national defense. It is very important, therefore, that we make the best of whatever opportunities come to hand in solving these problems.

"But, there will be such opportunities. If there is to be a temporary lull in the velocity of our over-all domestic economy, for example, it might well give us a chance to catch up on plant construction and plant improvements. It might also provide an opportunity for giving more attention to personnel recruitment, organization, and training, and other things that we have been too rushed to take care of as carefully as we would have liked to do, in these past few years of hectic expansion. Such a lull might even lead eventually to some special opportunity for financing, which other forms of business do not have. I say this despite the present tight money situation

(Please turn to page 60)

Design and Operation of Small Companies

By R. J. POLLOCK

Part 10
Public Relations

MANY PERSONS gage the public relations aspect of the telephone business by customer reactions to service and company policies evidenced at the commercial office, on the street, and in letters. Actually, however, public relations touches every department and every phase of telephone company operations.

In many cases, we have a tendency to exploit many expressions of approval of our service far beyond their actual significance, which, in itself, would seem to indicate that we are aware of numerous existing unsatisfactory service conditions. It is natural to be pleased with complimentary comments about our service, however, I am afraid that the industry as-a-whole has neglected and is neglecting the building up of favorable public relations.

If this is not true, then why do we hear so much opposition to and adverse comments about rates for telephone service which is the best communication service in the world? Does it mean that the telephone-using-public-at-large expects the investor to invest his money in the telephone business at a lesser return than he can secure in other fields; or does the public think a telephone company can purchase material and labor at a cost below the average market price; or do telephone users assume that the living costs of persons engaged in the telephone industry are below that of the average wage earner and, hence, can be paid lower wages?

Obviously, this is not the case since Americans are agreeable to paying a fair price for a commodity if they believe they are getting their money's worth.

Many telephone companies purchase advertising space in their local newspapers and depict, in an attractive way, the various services that are available to telephone users. In some instances, the charge for some of them will be set forth, mainly to show their cost on a daily basis, or in comparison with prices of other commodities. This is a normal procedure for any business which has been organized to sell a commodity or service, and the success of the program will depend on the public approval of the merchandise and an acceptable price.

Newspapers will, on the other hand, editorially inform the public of any rate increases which might be granted to the telephone company, and invariably they will feature the rate of return on the rate base which was found to be reasonable by the regulatory body. In most cases, and for some reason or other, the newspapers place great importance on this news and will play it up on the front page, while other stories that have a far greater effect on the public's pocketbook will appear on a back page.

While the majority of the subscribers in any exchange will accept the new rates, perhaps with reluctance, many subscribers will brand the company as a monopoly and place very little, if any, weight on the fact that the business is regulated by a governmental body.

Human psychology, being what it is, will, in many cases, cause the general public to come up with the idea that the telephone business is a protected business and "guaranteed" a rate of return far in excess of that realized in other business ventures.

In some cases, this will result in the removal of telephones, even before the effective date of the rate increase, but experience shows that most of them are reinstalled at a later date. However, the volume of service complaints will increase, be they for real or imaginary reasons, all of which will be accompanied by a build-up of public objection to the increase, which will be reflected into every section of our common life be it in the office, factory, bridge table or over the back fence. Because of this adverse action, some individuals within the telephone industry have expressed the thought that possibly we are approaching a level beyond which rates cannot be increased. In the opinion of this writer, this thought is wholly unrealistic and it was arrived at without considering many of the basic considerations.

Other utilities have experienced the same type of reaction, but to a lesser degree, due mainly to public misunderstanding of the basic conditions which confront the different utilities in their respective fields. However, the telephone field is unique in that it is the only one which owns and maintains the terminating equipment on the customer's premises. This equipment, consisting of the telephone and any other customer-housed facilities, is, from the subscriber's viewpoint, the extent of the facilities needed to supply telephone service. In other words, in the customer's way of thinking, it assumes the status of a "Magic Box" capable of transmitting and receiving the spoken word without additional equipment.

We, in the communication field, are aware of the necessity of supplying a pair of wires between the customer location and the central office, and the condition should be evident to the general public if it takes the time to think about it. However, many of the complaints which are received would suggest that the public gives little thought to this point.

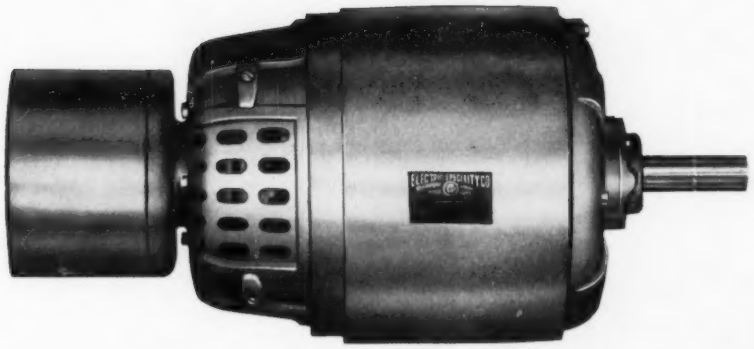
Suppose we consider an existing subscriber who has had single line service at a given location for some time. After months of planning he decides to build or buy another home in an outlying location where telephone facilities are short or are non-existent. In far too many instances, he will request that his existing service be moved to the new location on moving day in the same manner that one would move the family piano. If the telephone company cannot conform with his request, or can only partially fill it by supplying party line service, customer dissatisfaction will set in to a degree commensurate with the value he places on single line service.

The telephone company, on the other hand, places wire or cable at some later date to supply the pair of wires to the location in order to conform with the customer's original request. Everyone concerned, including the customer and the company, should now be pleased since the source of dissatisfaction has been removed.

However, when the customer made the original request, he probably thought that a pair of wires were available at

(Please turn to page 42)

ESCO RINGING EQUIPMENT



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DRIVE MOTORS

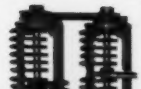
with *permanently* accurate speed regulation

In telephone ringing equipment, accurate speed regulation for the drive motors is one of the vital factors affecting equipment performance. But accurate regulation alone is not enough — it's regulation that stays accurate for the entire life of the equipment that counts.

In ESCO ringing equipment, all drive motors for DC operation incorporate speed regulators of unusually rugged design. These long-lasting regulators were originally developed to meet the strict standards for naval and marine applications where high accuracy calls for corresponding ruggedness and dependability as well. Drive motors for AC are reluctance-synchronous types to assure reliable built-in regulation over the widest fluctuations in motor loading and voltage supply. ESCO motors are built to order in every type and rating for standard and special power sources. Each incorporates the extra refinements that are the result of ESCO's forty years of experience in designing and building special rotary electrical equipment.

Look into the full facts on ESCO drive motors and other ringing equipment components — see for yourself why so many equipment engineers and suppliers choose ESCO — *send for free booklet today.*

Lifetime drive motors



Compact, accessible interrupters

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"Ready-to-go" pre-wiring

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ADDITIONAL ESCO FEATURES (details in future ads in this series) explain why ESCO components are included in the installations of prominent suppliers like Automatic Electric Co., Federal Telephone and Radio Corp., Kellogg Switchboard Supply Co., Leich Sales Corp., Stromberg-Carlson Co.

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Everything
LEICH
A MEMBER OF THE GENERAL TELEPHONE SYSTEM
ONE OF AMERICA'S GREAT COMMUNICATIONS SYSTEMS

Needs Maintenance...but—

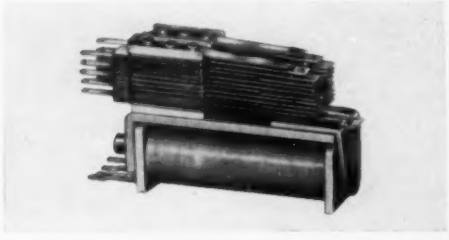
LEICH DIAL SYSTEM users tell us that it is easier to understand and maintain than any other dial switching system.

It's true that the Leich Dial System requires maintenance. Just about everything does. It's also true that the Leich Dial System requires less upkeep than any other dial system.

Telephone men with no dial experience operate and maintain the Leich Dial System easily. Many of them have learned the few fundamentals they need to know by attending Leich's training school. We hold classes several times a year at the Leich Electric plant in Genoa, Illinois.

We're happy to report that there are now over 800 Leich Dial Systems giving their owners easy-to-understand, dependable switching. This kind of service can be yours, too. Write today for more information.

Here's Why—

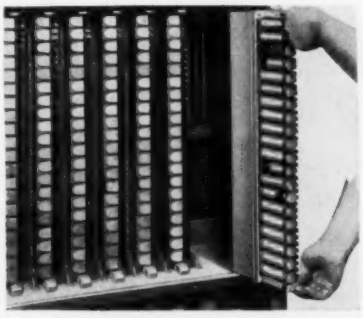


1. All-Relay Dependability

The Leich Dial System is an all-relay dial switchboard. Leich relays are well known for their reliability of operation and long life. They eliminate mechanical switching mechanisms which are apt to wear and require maintenance or adjustment

Leich relays have been tested for many million operations with no failures. Leich relay-switches have withstood millions of operations without readjustment, replacement, or signs of wear.

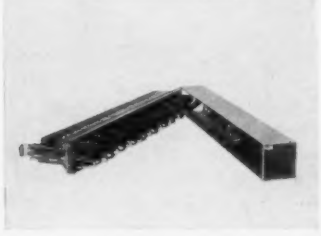
Your switchboard man can learn the basic maintenance more quickly because he is more familiar with relays than with mechanical parts.



2. Jack-In Flexibility

You can jack-in lines, links, and selectors with the flexible Leich Dial System. This eliminates the need for factory installers, soldering, and wiring.

If trouble should develop in a relay-switch or a relay bar, it's no great worry. A spare part can be jacked-in and the part in trouble returned to the shop for expert servicing.



3. Everything Is Accessible

The Leich Dial System has no back-to-back arrangements. You don't have to spend hours removing one part to get at another.

All the parts are arranged so that each is visible and accessible. For example, note the relay bar above. It can be slid out from its jack and in a minute or two the cover opened up to expose the relays and the wiring.

LEICH SALES CORPORATION, 427 WEST RANDOLPH STREET, CHICAGO 6, ILLINOIS

PACIFIC COAST: 11401 WEST PICO BLVD., LOS ANGELES 64, CALIFORNIA SOUTHWEST: 1227 SLOCUM STREET, DALLAS 7, TEXAS

SOUTHEAST: 5126 S. LOIS ST., TAMPA 11, FLA.

manufacturers of telephones, switchboards and related apparatus since 1907

his new location, otherwise he might not have made the request. If, then, we continue our train of thought, we arrive at the point where we wonder why the customer assumed there would be facilities at his new location, and if he gave thought as to who supplied the money to install them and, above all, to the fact that there would be no return on that investment while it was not being used. We in the telephone business know the answer, but as far as the customer is concerned his telephone is merely an instrument which can be moved anywhere in the exchange with a minimum of effort on his part and that of the company.

The point is further illustrated by another example, which has been more or less amusing to those of us who have had the misfortune of encountering it. Here, the customer moves to a new location and when informed that service is not available because of the lack of outside plant facilities the customer replies, "The house is wired!"

Another example of customers' unfairness, or lack of thought, was exemplified in a complaint recently received in an exchange of the writer's company, during a severe storm. The customer was extremely irritated because her husband was unable to call to tell her that his plane was grounded. She readily understood that the storm prohibited the airline company from fulfilling its service obligation, but, to her, as far as the telephone company was concerned that was an entirely different matter.

Another condition which is cited here to indicate customer thinking, pertains to urban party-line subscribers. In far too many cases, it is assumed that the party-line service will be equivalent to single line service, despite the fact that one to three other parties have the privilege of using the same circuit. The lesser rate in effect for party-line service of course, was set up to cover joint use of a line, but in many cases the subscriber does not consider this point, especially in cases where a regrade to a higher type of service is not wanted because of the increased rate.

These examples and many more like them give an indication of the importance of telephone service to the general public. When we consider what the doctor, and such businesses as the television repair shop, the dry cleaning establishment, and the corner grocer would do without the telephone, the core of the customer relation picture is evident. It also is certain that public opinion will be formed in direct proportion, one way or the other, to the quality of service given and customers' approval of or dissatisfaction with it.

The resulting voice of the people will have an affect on the company which will be magnified, favorably or adversely, in connection with any rate hearing or political campaign. The mild ripple which accompanied the increase from 5 to 10 cents for a cup of coffee in the local restaurant, compared with the identical increase in the local paystation telephone rate, would suggest that our industry still has a major job to do in public education.

In a program of building public relations and sales much thought must be given to the formulation of effective procedure which will produce the desired results. Perhaps we should follow the plan of the movie theatres, in which they project onto the motion picture screen words and sounds that you consciously do not see or hear, but they are there. The audience is not aware of them, but they form suggestions in the sub-conscious mind, with the net result that during intermission the sale of peanuts, popcorn and pop increases in amazing proportions. In this case the power of suggestion has produced results which might well be applied to telephone service.

Formulating an effective public relations and sales program will require a thorough education of the people who undertake the job so that they will be well-versed in all phases of the telephone problem, both from the customer and company standpoints. An advertising and sales program designed to sell a radio or a toaster is quite different from one selling a telephone and the continued service that goes with it, and, in the opinion of the writer, the latter must be specifically geared to convincing the buyer that he simply cannot do without a telephone, or perhaps an extension or two, or any other service adding to his well-being or convenience.

The small exchange owner or manager, who, incidentally, has a better opportunity to start at the base of the public relations picture because of his more intimate contact with the people in the exchange area, needs to give attention to this important subject, the same as those in large companies. The various considerations involved in formulating a good public relations program should be understood by all company personnel so the program can be laid out to cover the advantage or disadvantage of stressing particular points or ideas. The merits of a point or condition in one phase of the telephone picture are, in some cases, offset by a negative effect it will have on another phase.

Any public relations program starts with employes, because in any contact between a subscriber and an employe, the employe, in the eyes of the customer, represents the company and his handling of any situation will be interpreted as company policy.

Education of management as to the desires and demands of customers also should be incorporated in the public relations program because if the program is to be effective, it must reflect the combined thinking and action of the personnel in every department of the company—from top to bottom.

(To be continued)

V. E. Larson to Manage United of Carolinas

Vern E. Larson, who, for the past seven years, has been a director, vice president and general manager of United Telephone Co. of New Jersey, has been elected to similar posts with United Telephone Co. of the Carolinas, Inc., it was announced by Alden L. Hart, Kansas City, Mo., president of United Utilities, Inc., the parent company. He succeeds John E. Cline whose resignation became effective Jan. 1, 1958.

Mr. Larson entered the telephone field in Minnesota in 1926 and served in various capacities with several operating telephone companies in that state before going to New Jersey in 1950.

It was stated that shortly after Jan. 1, Mr. Larson would move from Newton, N. J. to Southern Pines, N. C., the operating headquarters of United's North and South Carolina properties.

Start 5½ Million Dollar Expansion in Las Vegas

The Southern Nevada Telephone Co. of Las Vegas, Nev., has started a 5½-million-dollar expansion program which includes the construction of two new central offices with an ultimate of 10,000 lines each. At present the company has in excess of 36,000 stations.

Kellogg Switchboard & Supply Co. will furnish equipment for a new crossbar tandem office and 25 positions of toll board to augment the present toll system.

Rotary switching equipment of United States Instrument Co., manufacturer, will be installed in the two new central offices. The initial order provides for 6,600 terminals.

"The rapid growth of this resort city has already taxed facilities of the four units of central offices completed for dial conversion only three years ago," said H. G. O. Weiler, president.

BELL TELEPHONE LABORATORIES DEVELOPS NEW COMPACT COMPUTER FOR U. S. AIR FORCE

J. A. Githens, B.S. in E.E., Drexel Institute of Technology, and J. A. Baird, Ph.D. in E.E., Texas A. & M., check the control panel of Leprechaun, a new high-speed computer which solves extremely complex problems in one-tenth of a second. Small size and low power are made possible by new design principles and Bell Laboratories' invention of the transistor.

The United States Air Force assigned Bell Labs an interesting assignment: develop a new kind of electronic computer. The major requirement was greater simplicity. Of course, no computer is simple, but this one (known as "Leprechaun" to its designers) is much smaller and simpler than most of the computers currently in use.

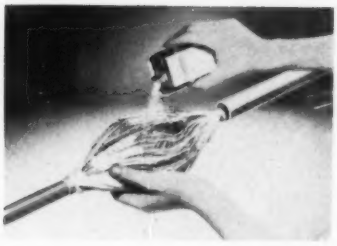
It has only some 9000 electrical components; 5000 of them are transistors. As a result, Leprechaun has less than one-third the components of conventional computers. This facilitates testing, experimentation, assembly and service.

Even in its experimental state, Leprechaun is a stimulating example of great strides in the simplification and miniaturization of circuitry . . . a problem of profound interest to all Bell Laboratories researchers as they develop radically new equipment for your future telephone service.

BELL TELEPHONE LABORATORIES

WORLD CENTER OF COMMUNICATIONS RESEARCH AND DEVELOPMENT

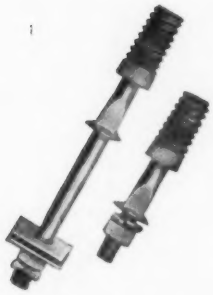
Don't tie up capital in inventories...



Simple and Effective! The quick, easy, positive way to dry splices in lead-covered cable is to sprinkle Drierite Dessicant granules in among the conductors. This W. A. HAMMOND DRIERITE COMPANY product will not harm the sheath, conductors, or insulation.

If you have a reliable source of supply you do not have to carry a large inventory. Your capital, instead of being tied up, can be used to extend your subscriber services. More services mean more revenues. In Kellogg you have a source that has been known for outstanding reliability for more than 60 years. Kellogg has built this reputation by carrying in stock a greater quantity of line supplies than any other source . . . and by delivering when specified. It is literally "money in the bank" when you rely on Kellogg to carry your inventory for you.

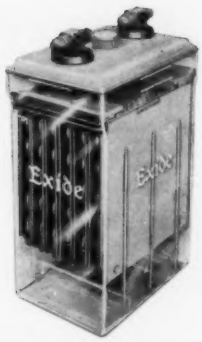
S-5 Sub-Cycle for Synchromonic ringing. Generates 30, 42, 54, and 66 cycles, plus a fifth frequency. Ringing frequencies are locked to the A-C line frequency. Provides maintenance-free operation. Made by LORAIN PRODUCTS CORPORATION.



Joslyn R.E.A. Standard Wood Cob Steel Pins—Joslyn J1187 ⅝-inch Steel Pin is assembled with a J139 lock washer and square nut; the Joslyn J1188 pin has two 2" x 2" x ⅛" square washers, nut, and M-F locknut. Cobs are of seasoned Oak or Locust boiled in paraffin. Pins are forged, high carbon, open-hearth steel, hot dip galvanized.

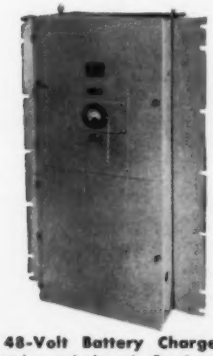
JOSLYN MFG. & SUPPLY COMPANY.

Fine Telephone Poles. Dierks Pressure-Treated Southern Pine Telephone Poles, up to 110 feet. Creosote or Penta treatment. Prompt shipment out of stock. DIERKS FORESTS, INC.

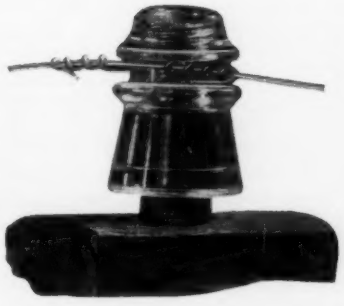


The Battery That Stays Young for Years. Built right into the Exide-Manchex Battery is a reserve supply of lead that converts automatically to active material as it's needed during the battery's long life. Hence, it keeps its full capacity for years. Exide Industrial Division, THE ELECTRIC STORAGE BATTERY COMPANY.

Phone Kellogg for line supplies you want when you want them



New 48-Volt Battery Charger Line. Completely redesigned Raytheon Recti-Chargers (R) feature no load to full load regulation of ±1%, no tubes, automatic compensation for rectifier aging, no audible hum. Most compact units on the market—single and three phase, output from 3 to 400 amperes. RAYTHEON MANUFACTURING COMPANY.



Test of Time proves high quality of Hemingray Insulators—a product of OWENS-ILLINOIS. Many sizes and styles available for immediate delivery. No. 17, shown, used for all exchange circuits—for toll and trunk circuits not exceeding 10 miles.

This Cook Stranterm is available in 6, 11, and 16 pair. The only strand-mounted Cable Terminal designed for a flexible system of Minigap or Mytigap protection. Supplied with either plastic or lead sheathed cable stub.

COOK ELECTRIC COMPANY.

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You can reduce unit loss and use of repeaters with

CEECO LOADING COILS

From an economic and service standpoint, the use of telephone cables in place of open wire circuits are generally preferred. However, attenuation resulting from the higher series resistance of the cable circuits, and their higher capacitance and reduced inductance poses a problem. This is where loading coils such as manufactured by CEECO are used. By applying coils on telephone circuits, the unit loss can usually be reduced to one-third or one-fourth the non-loaded value. For example, by using the proper loading, a 24 gauge cable pair can be made as satisfactory as a non-loaded 19 gauge cable pair having three times as much copper. Other advantages are that it is possible to avoid the use of repeaters in many cases by extending the transmission range or to employ fewer repeaters. The voice frequency loading coils are primarily designed for use on two-wire telephone circuits in non-quadded paper insulated or plastic cables. Coils can be furnished for quadded inter-office trunks and toll entrance cables.

WRITE FOR CIRCULAR ON CEECO LOADING COILS

BUCKEYE TELEPHONE & SUPPLY CO.

1250 KINNEAR RD. **COLUMBUS 21, OHIO**

Lincoln (Neb.) T&T Makes Supervisory Appointments

Supervisory appointments in the plant department of The Lincoln (Neb.) Telephone & Telegraph Co. were announced recently by Max C. Walker, general plant superintendent.

Ralph J. Connors, Lincoln wire chief since 1950, becomes plant supervisor in the general plant superintendent's office. Byron D. Pattison succeeds Mr. Connors as Lincoln wire chief. Robert W. Blackford becomes equipment foreman and Dale C. Weaver service foreman.

R. J. CONNORS

B. D. PATTISON

Mr. Connors started as a shopman in Lincoln in 1925 and became a warehouseman and clerk before moving to York as a clerk in 1937. He moved to David City in 1938 as assistant area manager before transferring to Nebraska City in 1941 where he was a combinationman, chief testman and wire chief. He returned to Lincoln as assistant wire chief in 1949.

Mr. Pattison was first employed as a groundman at Steinauer in 1934 and worked at Humboldt and Tecumseh before becoming a lineman in the construction department at Lincoln in 1935. He was a building serviceman, shopman, combinationman and an installer-repairman PBX before becoming service foreman in 1951. He was named equipment foreman in June 1957.

After working as an installer for Western Electric from 1944 to 1951, Mr. Blackford joined LT&T as a combinationman at Lincoln in 1951. He became an installer-repairman PBX in 1953 and service foreman in June 1957.

Mr. Weaver was a groundman and lineman in the construction department from 1945 to 1948 and became a combinationman at Lincoln in 1952. He was named an installer-repairman PBX in 1955.

Connors and Pattison are members of the Frank H. Woods chapter of the Independent Telephone Pioneer Association.

To Test Shortened Number Prefix in Yellow Pages

In order to reduce the size of the 1958 Chicago classified directory, Illinois Bell Telephone Co. plans to print only the first two letters of the telephone number prefix on about a fourth of the 175,000 yellow-page listings, it was reported on Dec. 24.

For example, by reducing Brunswick 8 to BR 8 the company can give five columns of listings on a page instead of the present four. By 1959 all listings will be in the shortened form.

Obituary

J. WALLACE CHERRY, 76, vice president of the Champaign County Telephone Co., Urbana, O., died recently in Columbus, following a short illness.

He had been connected with the Champaign County Telephone Co. for more than 40 years.

Surviving are his wife, Lillian, and a son, John W. of Cincinnati.

Communications Meeting

The Association of American Railroads has announced that the 34th annual session of the association's Communications Section will be held on May 13, 14 and 15 at the Hotel Muehlebach, Kansas City, Mo.

Virtue of Decision

"Irresolution is a worse vice than rashness. He that shoots best may sometimes miss the mark; but he that shoots not at all can never hit it . . ." —FELTHAM.

Send a TRUCKSTER® instead of a Truck!

Cushman® 780

World famous for Economy!

Servicing outside telephone booths is only one of the many jobs for which the telephone industry is using the Cushman 780 Truckster with maximum efficiency and economy.

The Cushman 780 Truckster saves man-hours by putting your booth servicemen and their equipment "on wheels." At the same time, it saves the expense of operating a conventional vehicle and, because of its size, eliminates the hazards of parking in congested areas.

The 780 Truckster also is being used to good effect as a teletype repair wagon and for hauling supplies.

Ruggedly built and driven by the powerful Cushman Husky 4-cycle engine, the 780 Truckster handles an 800 pound payload with ease. It not only operates at a cost of less than a penny per mile, but requires a minimum of maintenance expense.

The 780 Truckster is available with fiber glass cab and side curtains as optional equipment, and in a variety of body styles to fit your specific needs. Electric starter is also available.

See your dealer for FREE demonstration or write for free booklet

SOLD AND SERVICED NATIONALLY
Replacement parts immediately available

CUSHMAN MOTOR WORKS, INC.
A subsidiary of Outboard Marine Corporation
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Please send complete information on 780 Truckster
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for mobile radio... microwave...carrier ...repeaters, etc.

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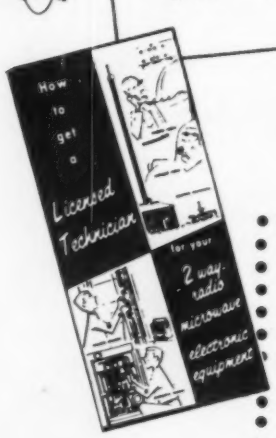
Here is a proven plan for providing training in electronics for your present technical staff. The great development of electronic devices for use in telephony makes it imperative to mentally "re-tool" your men.

Many telephone companies have enrolled their technicians for training. The West Coast Telephone Company selected our Employers' Plan for training their men. One group has completed its training and a second group is well under way. In less than a year they have acquired a group of experienced telephone technicians who know electronics.

For full details on our Employers' Plan send for a free copy of our illustrated booklet.



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Cleveland 3, Ohio

Please send full information on your Employers' Plan for training technicians.

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POSITION _____

COMPANY _____

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CITY _____ STATE _____

$1 Million Tampa Bridge Named For Carl Brorein

A new million-dollar bridge and its approach streets, in Tampa, Fla., has been named for one of the city's leading businessmen—and a prominent Independent telephone executive—Carl D. Brorein, president of Peninsular Telephone Co.

Designation of the new bridge and streets was a surprise honor to Mr. Brorein. Tampa's Mayor Nuccio presented an ordinance to city representatives and members of the citizens advisory committee on bond projects. The nomination won quick support and commendation.

C. D. BROREIN

The mayor's proposal names the first project of a 20 million dollars bond issue for Mr. Brorein. The bridge will span the Hillsborough River, through the heart of Tampa, between the Platt and Lafayette Bridges.

The ordinance adopted lists Mr. Brorein's many civic and governmental appointments and states the honor goes to him for these services.

In acknowledging the honor, Mr. Brorein said:

"While the proposal came altogether unexpectedly, I feel I must, with a deep sense of appreciation and humility, express to you, Mr. Mayor, and to each member of the board, my thanks for the gracious action which you took regarding the naming of the Brorein Street Bridge. The rewards of living in Tampa and seeing the city grow and prosper have been many for those of us who have lived here over the years. Each of us has the obligation to the extent of his opportunities and abilities to make this city the best possible place in which to live and raise our families. I am happy, if, in any modest way, I have succeeded in contributing to our common progress and welfare."

Mr. Brorein has lived in Tampa

since 1920, and has been president of the Peninsular company for the past 20 years. Married in 1919 in Washington, D. C., to Ethel Kieke, a fellow student at the University of New Mexico, the Broreins have four children.

The eldest, Carl D. Jr., is corporate secretary and assistant general manager of The Peninsular Company; William J., formerly with Bell Telephone Laboratories, is now an engineer with General Cable Corp. in New York City; Marjorie L. (now Mrs. Michael Mainguth) lives next door to her parents in Tampa, and the youngest, Robert L., is with Stromberg-Carlson in Rochester, N. Y.

Mr. Brorein long has been active in Independent telephone association activities. He is a director and past president of both the United States Independent Telephone Association and Florida Telephone Association.

Clark Mull Named to Board Of Indiana Association

Clark Mull, manager of the Knightstown Telephone Co. since 1950, was elected to the board of directors of the Indiana Telephone Association at the meeting held in Indianapolis on Dec. 23. Mr. Mull is a veteran in the telephone industry. For several years he has served as president of his association telephone district, which is composed of 22 counties.

For a number of years Mr. Mull was in the general accounting department of the Public Service Co. of Indiana. Prior to this he was employed in plant accounting of Indiana Bell Telephone Co.

B. C. Company Announces Staff Appointments

Four high level staff changes in the British Columbia Telephone Co., Vancouver, Canada, and its associate firm, North-west Telephone Co., have been announced by Gordon Farrell, president of both companies.

R. J. Mitchell, B. C. Telephone Co. chief engineer, has been made assistant vice president, staff engineering, and B. R. Tupper, vice president and general manager of North-west Telephone Co., has been appointed chief engineer of B. C. Telephone Co.

M. E. Green, chief engineer, Northwest Telephone Co., has been named radio engineer, B. C. Telephone Co., and C. J. McLean, executive assistant, North-west Telephone Co., has been appointed manager of North-west.

The appointments became effective Jan. 1.

ELECTRIC PLANT NEWS

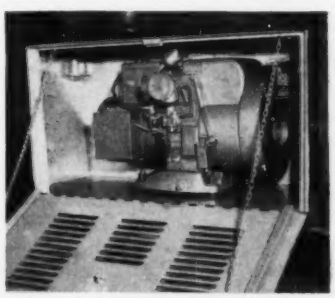
Truck-mounted electric plant cuts costs two ways

Onan Plant provides A.C. power for electric tools and lights, and D.C. output to charge batteries for radio communication.

Utilities using this dual-purpose Onan Electric Plant on trucks report savings ranging from *$2.00 per day* per truck to *$800.00 per year* per truck . . . for the battery-charging feature alone. Before installation of the Onan plant it was necessary to keep the large truck engine running to charge batteries, extremely wasteful from the viewpoint of fuel and engine maintenance.

The Onan plant shown is a Model O7AK, developing 750 watts of A.C. with about 8 amperes for 12-volt battery charging. It is powered by an Onan single-cylinder, air-cooled gasoline engine direct-connected to an Onan all-climate generator in a compact, rigid, long-life unit. A.C. output is sufficient for operation of drills, saws and other tools used for construction and maintenance.

Other vehicular battery charging plants and A.C. models available.



Vacu-Flo cooling system permits enclosed installation

With Onan's Vacu-Flo system, air is drawn (rather than blown) through generator and engine, and discharged through a duct to the outside. An Onan air-cooled plant with Vacu-Flo can be installed in a small compartment within truck or trailer.

Ask your Onan distributor about this dual-purpose unit or write for circular on three battery charging methods.

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you can always depend on. For Klein tools and equipment are designed better for your jobs—made of the finest materials—individually tested and inspected. Look for the familiar Klein trade-mark—serving the electrical industry "since 1857."

ASK YOUR SUPPLIER

Foreign Distributor: International Standard Electric Corp., New York

SEND FOR NEW POCKET TOOL GUIDE

100 years of service to linemen, electricians and industry is back of this new Pocket Tool Guide No. 100. A copy will be sent to you upon request, without obligation.

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Courts and Commissions

Two New York Independents Win Temporary Increases

The New York Public Service Commission on Dec. 27 authorized Allegany Telephone Co. and Jasper-Steuben Telephone Corp., both subsidiaries of Independent Telephone Corp., to make temporary increases in their respective rates effective Jan. 1. The new temporary rates will remain in force pending the outcome of a current commission investigation to determine the permanent rates to which the two companies are entitled.

Allegany Telephone Co. serves about 1,700 telephone stations through automatic central offices in Alfred, Andover and Almond. It had originally proposed to increase residence rates on Oct. 1. That tariff was suspended and has since been the subject of public hearings.

The Jasper-Steuben company furnishes dial service to 268 subscribers through a central office at Jasper and magneto service to 77 others in the towns of Greenwood and West Union through a switchboard owned and operated by the Greenwood Telephone Association.

The new rates which it is being allowed to put into effect temporarily are the same as those it sought to introduce on Oct. 1 and which have also been under suspension and investigation.

The commission's actions on Dec. 27 were predicated on data received at public hearings which indicate that unless the two companies receive some increase they will have insufficient revenues with which to pay interest on outstanding notes and dividends on preferred stock.

Ill. Bell Asks Increases on Specially Handled Calls

A petition for rate increases for some intrastate long distance calls requiring special handling was filed by the Illinois Bell Telephone Co. on Dec. 27.

Affected by the petition to the Illinois Commerce Commission would be person-to-person calls of more than 25 miles, station-to-station collect calls of more than 20 miles and two types of service used by business firms.

Most of the increases, which would become effective Jan. 27 if granted, would vary according to distance.

Company officials said the increases in person-to-person calls could not be reduced meaningfully to percentages. The minimum increase, 5 cents, would be for distances from 26 to 30 miles.

A maximum increase of 35 cents would be made for distances from 330 to 400 miles.

A special charge of 15 cents would be added to all collect station-to-station calls of more than 20 miles.

At present a 5 to 10-cent charge, depending on distance, is charged for such calls from 21 to 36 miles. There is no special charge for such calls above 36 miles.

The present special charge of from 15 to 20 cents, depending on distance, for collect station-to-station calls of less than 20 miles would be continued.

Report charges, made for special handling of uncompleted person and collect calls by business firms, would be raised 5 cents. They now range from 10 to 30 cents, depending on distance.

Special reverse charge service, which enables customers of business firms to call toll free, would be increased one dollar monthly. The present charge is $4.00 a month:

Four Minnesota Companies Authorized to Buy

The Minnesota Railroad & Warehouse Commission late in December approved the following four groups of purchases (number of stations served, in parentheses):

Johnson Telephone Co., Remer, on Dec. 26 secured authority to buy all the telephone properties of the Lima Township Telephone System, Remer (20); Remer Township Telephone System (17); Smoky Hollow Township Telephone System, Remer (14), and Thunder Lake Township Telephone Co., Remer (32).

Paul Bunyan Rural Telephone Cooperative, Bemidji, on Dec. 26 was authorized to buy the entire telephone property—including a toll line between Bemidji, Red Lake, Puposky, Nebish and Redby, Minn.—belonging to the Red Lake & Manitoba Railway Co.

Polar Rural Telephone Mutual Aid Corp., Drayton, N. D., on Dec. 26 gained permission to purchase all the

For telephone line wire
. . . bare or insulated

For rural distribution wire
. . . guy strand or messenger

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COMMUNICATIONS WIRE

Copperply wire introduces a unique combination of advantages and economies. For example: better balancing of circuits, suitability for future carrier circuits without additional line work, extended service life, improved long span installation, and sizeable economies both in insulating the wire and in line construction.

These gains stem largely from precise concentricity, linear uniformity, and a non-porous rust proof copper coating permanently united with a high tensile, precision-drawn steel core, as well as availability in continuous *non-welded* lengths up to 1,000 pounds.

Copperply is now available in High Strength and Extra High Strength grades, with either 30% or 40% conductivity, and in all standard sizes from No. 3 to No. 14 AWG.

Bulletin 202 gives additional data. Write National-Standard, Niles, Michigan.

NATIONAL NS NATIONAL-STANDARD Company **STANDARD**

DIVISIONS: NATIONAL-STANDARD, Niles, Mich.; tire wire, stainless, music spring and plated wires • WORCESTER WIRE WORKS, Worcester, Mass.; music spring, stainless and plated wires, high and low carbon specialties • WAGNER LITHO MACHINERY, Secaucus, N. J.; metal decorating equipment • ATHENIA STEEL, Clifton, N. J.; flat, high carbon spring steels • REYNOLDS WIRE, Dixon, Ill.; industrial wire cloth

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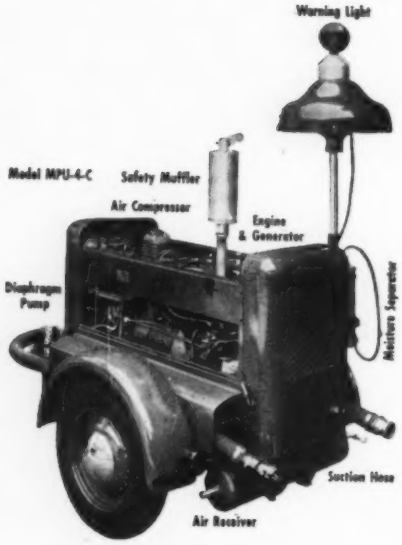


MOBILE POWER UNIT

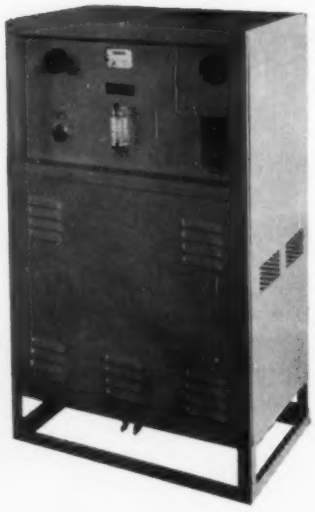
- Generator slow speed for quietness
- Pump—Diaphragm type to remove seepage and drain back
- Air Compressor — to put cables under pressure for cutovers or repairs

  Furnished with or without pump and compressor
- 300-Watt floodlight illuminates working area
- operates soldering pot and iron, electric and air tools
- electric blower to ventilate manhole
- supplies dry air for cable cutovers, flash testing, etc.
- diaphragm pump can be operated from manhole by push button control
- buzzer signal for summoning helper
- light, easy to handle

MODEL A Air Compressor Dehydrator

Exchange equipment designed to supply chemically dry air for telephone cables, aerial and underground, this unit can supply as many as 30 cables. The unit is equipped with volume recording air meter, high and low pressure alarm switches, humidstat and hour meter.

- Completely automatic in operation
- Air Purifier to eliminate oil mist
- Incorporates the latest safety devices



write or phone

S & G MANUFACTURING CORPORATION
P. O. Box 1309 • New Orleans 10, La. • RAymond 3142

property of the Robbin Rural Telephone Co. located near Robbin, Minn. (90).

New London Telephone Co. on Dec. 27 was granted authority to buy the entire telephone property of New London-Norway Lake Telephone Co. (30) and the Nickel Telephone Co., New London (40).

Four California Companies Awarded $15,271,000 Raise

The four telephone companies serving the greater Los Angeles area on Dec. 11 received what will amount to a rate raise of $15,271,000 as the result of an order shortening the distance for multimessage unit calls.

The order, issued by the California Public Utilities Commission, was made effective Jan. 6. It affects Pacific Telephone & Telegraph Co., General Telephone Co. of California, California Water and Telephone Co. and the Sunland-Tujunga Telephone Co.

It will increase the cost of calls beyond the subscriber's local calling area. In most cases the units charged for such calls are increased both for the initial three minutes as well as for the time beyond the initial period.

In general, a call which now costs two message units will cost three message units after Jan. 6, explained a spokesman for the commission.

Under the ruling, Pacific T&T will receive additional annual revenues from unit calls of about $11,288,000, while General will receive $3,125,000, California Water & Telephone, $790,000, and Sunland-Tujunga $68,000, it was reported.

The order was an interim action pending final rulings on rate increase applications already filed by PT&T, General and California telephone companies, it was stated.

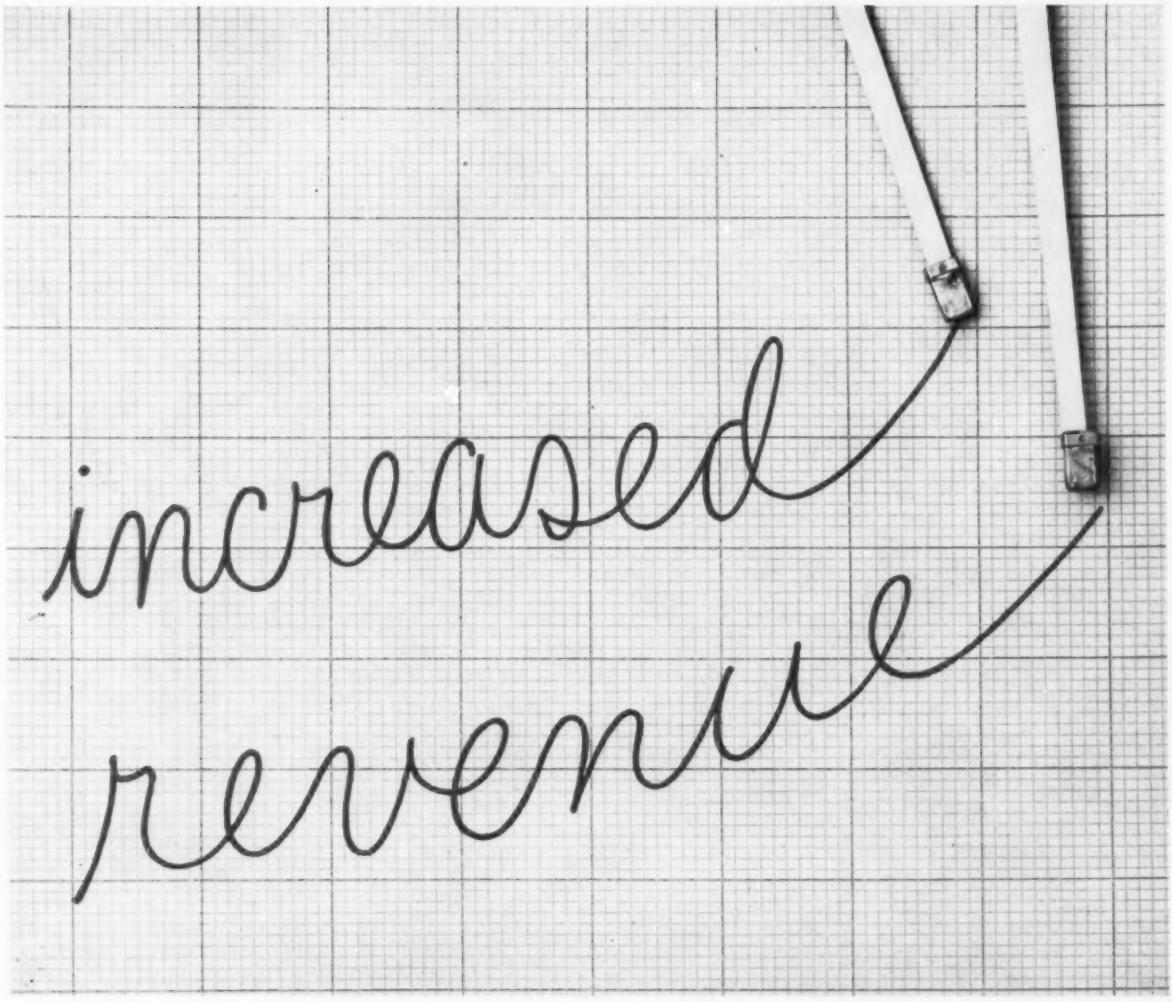
All four companies joined last Sept. 27 in an appeal for interim relief for providing service in the Los Angeles extended area within their serving areas and through interchanged calls.

Leaves Nebraska Commission

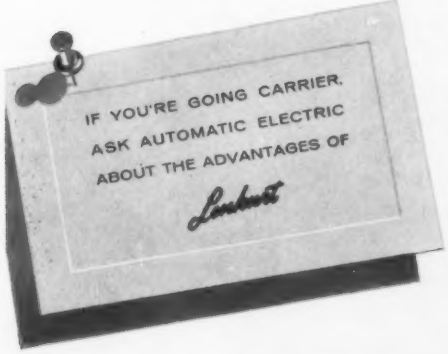
The secretary of the Nebraska Railway Commission, Fred J. Hurlbut, resigned on Jan. 1 to enter private law practice at Kimball, Neb. He had been with the commission since July 1953.

New Jersey Bell Gets Raise

New Jersey's Public Utilities Commission authorized the New Jersey Bell Telephone Co. to increase its rates by 7 per cent for residence service and 11 per cent for business use, effective



TELEMETERING...



Leasing circuits for TELEMETERING . . . one of the fast-growing new opportunities for you to get extra revenue. All over the United States, more and more circuits are being leased from operating telephone companies for the transmission of metered data (temperature, pressure, flow, etc.) to distant control points. *Who's in the market?* Pipelines, power companies, refineries, chemical processors, steel manufacturers, many others. *How can you add channels economically to tap new sources of revenue like this?* With Lenkurt Carrier, of course. Automatic Electric provides Lenkurt equipment in a complete, easy-to-own package—engineered, furnished and installed. Our engineers would be glad to help you; just drop us a line today. Automatic Electric Sales Corporation, Northlake, Illinois.

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One of America's great communications systems

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2. Good, Tough Buckskin Work Gloves
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EXPORT: Copperweld Steel International Co.
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W. M. BASHLIN CO.
GROVE CITY, PA.

Jan. 1, to produce 11½ million dollars in additional annual gross revenue (TELEPHONY, May 11, p. 38).

Pacific T&T Ups Rate Request in Washington

Pacific Telephone & Telegraph Co. on Dec. 10 filed with the Washington Public Service Commission a request for increases in rates amounting to an estimated $1,625,000.

In an earlier request, filed in August, the company sought an estimated $7,375,000, the total now approaching 9 million dollars (TELEPHONY, Aug. 31, p. 38.

The new request—asked "to offset" recent pay raises as nearly practicably as possible," seeks to change toll charges on intrastate long distance calls. Increases sought include a five-cent raise for three-minute station-to-station calls between points 60 miles apart or less and a boost of 15 to 20 cents on all three-minute person-to-person calls.

The earlier request seeks to raise business and residence rates.

A spokesman for the company said the new rates are being sought to offset pay raises granted employes.

West Coast Company Applies For Approval of Preferred

West Coast Telephone Co. has filed an application with the Washington Public Service Commission for authority to issue 160,000 shares of convertible preferred stock, the company announced on Dec. 12.

Subject to commission approval the stock, officially described as junior cumulative preferred, $1.44 dividend convertible series, par $25, will be marketed through a group of underwriters headed by Blyth & Co., Inc.

The proceeds of the sale of this stock, approximately $3,750,000, will be applied to the cost of construction, completion and extension of the company's facilities, including those of its wholly-owned subsidiary, West Coast Telephone Co. of California.

Special Service Increases Asked by Bell in Missouri

The Southwestern Bell Telephone Co. on Dec. 20 filed an application with the Missouri Public Service Commission for increased rates on three special types of service.

The increases are sought in rates for extra listings in telephone directories, joint-user service, and key equipment.

The company said the requested increases would affect about 22,000 of its 875,000 customers in Missouri and would produce additional gross revenue of around $735,000 a year.

Edward G. Greber, general manager for Missouri, said the increases would offset by less than half the recent wage increases granted employes in a new contract.

Sues Over Directory Omission of Three Firms

Justice Frederick L. Kopff in Supreme Court, Kings County, N. Y., signed an order recently returnable Dec. 27 requiring the New York Telephone Co. to show cause why it should not be ordered to revise, republish, reissue and redistribute the Brooklyn classified directory or Red book.

The injunction was sought by Seymour R. Bittner, who alleged that three small companies which he heads were not listed in the classified directory although he had so requested of New York Telephone Co.

Mr. Bittner's companies, all in Brooklyn, were listed as AAA Metal Sandblasting Co., Myrtle Mirror & Glass Corp. and Glo-glass Corp. According to Seymour S. Detsky, attorney for Mr. Bittner, the three companies employ a total of "eight or 10" persons.

According to Mr. Detsky, the three companies obtain the bulk of their business through the listings and advertisements in the classified directory. He estimated that the companies will lose $25,000 for the year they will not be listed. Mr. Detsky said the application for the injunction asks the court to fix damages.

A spokesman for New York Telephone Co. said that about 140,000 copies of the Brooklyn classified directory for 1958 were then being delivered.

Wis. Commission Schedules Two Rate Applications

Wisconsin's Public Service Commission had scheduled during the week of Jan. 6 the following two hearings:

Application of the Washington Island Telephone Co. for permission to increase rates (Jan. 9).

Petition of the Valders Telephone Co. for authority to raise rates (Jan. 9).

Illinois Commission Names Temporary Secretary

It was reported on Dec. 23 that the Illinois Commerce Commission has named Lester D. Kiick, of Springfield, its acting secretary to succeed Frederick B. Resag, secretary, who died the week of Dec. 16.

Governor Stratton shortly is expected to name a permanent secretary.

PRESSURIZED CABLE SYSTEMS

The need for an automatic device to stand guard at intervals along pressurized cables has long been recognized. Now United Electric Controls has the answer . . . The Telephone Cable PRESSURE-GUARD.

Developed by U.E., in collaboration with the Bell System, the PRESSURE-GUARD is now available to all Telephone Companies as an aid in reducing cable maintenance costs.

In the past the location of a cable leak was a matter of man hours in climbing poles and manually checking pressure points. When the pressure guard detects a pressure drop it introduces an electrical resistance . . . which indicates at a central monitoring source a cable leak and the location.

Specifications Pressure-Guard

Field Adjustment Range	0 to 15 PSI
Factory Setting	2 ±¼ PSI on falling pressure
Pressure Response	4 ±½ oz.
Proof Pressure	30 PSI
Electric Rating	0.01 amp 110V DC
Load Resistor	Carbon composition 330,000 OHM 1 watt
Take-Off Tube	Tinned Copper 6′ x ¼″ x 0.035
Drop Wire	6′ Type SJ0 #18 stranded 0.2 conductor
Size	6″ x 4½″ x 2½″
Approximate Weight	1¾ lbs.

These specifications may be modified in a great variety of ways to meet the requirements of any given application.

UNITED ELECTRIC *manufactures a complete line of temperature, pressure, and vacuum controls. For applications requiring custom-built units or modified standard units, call upon a UE application engineer for recommendations. Write for complete specification and pricing data on the Telephone Cable Pressure-Guard. Similar data available on all other UE controls.*

UE® United Electric Controls COMPANY
85 SCHOOL STREET, WATERTOWN, MASS

Many Years of Acoustical Research and Development Make the Difference

Model 211

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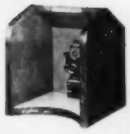
Model 601

Model 602

Each model of the Burgess-Manning "Hear-Here" Acousti-Booth is designed and built to needs in institutions, commercial buildings, schools, hospitals, stores, air and rail terminals, or other noisy, hard-to-telephone locations. Every Burgess-Manning Acousti-Booth incorporates highest quality acoustic material, scientifically applied, with the net result that extraneous noises are shut out in the noisiest spots — understandable conversation is locked in to give you the privacy of home. You are actually out of this world when you phone in an Acousti-Booth — even if you are right in the middle of a boiler factory. There is only one answer for your noise plagued telephone locations — a Burgess-Manning "Hear-Here" Acousti-Booth.

Write for Bulletin A-142-2 for complete details and prices on all Models of Acousti-Booths.

3 Heating Cooling Acoustical

BURGESS-MANNING COMPANY
Architectural Products Division
5970 Northwest Highway, Chicago 31, Ill.

Wisconsin Commission Rules On Utility Ad Costs

The Wisconsin Public Service Commission on Dec. 19 ruled that the cost of electric utility advertising dealing with public versus private ownership of facilities is not an allowable expense for rate-setting purposes in the state.

The commission said such expenses must be charged to miscellaneous income deductions which cannot be included in computing operating expenses for rate making purposes. It added:

"We wish to make it clear that in issuing this accounting order, we are taking no position one way or the other with respect to public ownership of power resources nor attempting in any way to influence the opinion of any person in regard to the matter or to restrict the right of any person to express and to publicize his opinion. Our order deals solely with the manner of accounting for such costs."

The commission said it had learned that in a number of instances advertising and other items of expense relating to the question of public ownership of power facilities had been included in operating expense accounts. The commission's conclusion was that those expenses were not "just and reasonable" operating expenses.

The Federal Power Commission permits such advertising items to be included as an allowable expense for the purpose of rate determination.

Grants Illuminated Dial Rates, Incorporation in Neb.

The General Telephone Co. of Nebraska, Columbus, was authorized on Dec. 9 by the Nebraska Railway Commission to charge 25 cents per month for illuminated dials. A $5.00 installation and move charge applies. Also approved were rates and charges for pickup, hold, intercommunication, cut-off and signaling for push button telephone systems.

On Dec. 10 the commission approved the sale of the property of the Clarks Telephone Co., owned and operated by Vinson A. Bittinger, to the Clarks Telephone Co., a corporation. A lending agency required the incorporation of the company in the execution of a loan for service improvements.

Asks Sale Approval in Ill.

Union Telephone Co. on Jan. 7 was to have had a hearing before the Illinois Commerce Commission on its petition to sell its properties to the Montrose Mutual Telephone Co.

Wisconsin Independent Granted $24,701 Increase

The Rhinelander Telephone Co. on Dec. 3 was authorized by the Wisconsin Public Service Commission to increase its rates $24,701 annually (TELEPHONY, Oct. 26, p. 170).

The company had sought an increase amounting to $32,976 a year, or about 11 per cent above existing rates.

MICROWAVES

Continued from page 27

have an estimated figure of $96,000 for all necessary equipment to provide point to point radio capable of carrying as many as 240 high-quality toll circuits. Under maximum application of this facility, cost per channel mile would be no more than $120.

In summarizing our comparison this far, we can build a toll pole line capable of carrying 64-message circuits for the sum of $95,000 or a microwave system for $96,000 capable of carrying 240-message circuits.

But, our comparison does not end here. Other considerations must be taken into account; probable circuit outage time, maintenance expenses, and factors of obsolescence or replacement.

To illustrate the reliability inherent in microwave operation, let's examine recent lost circuit time figures experienced on Southeastern's Crestview-Ft. Walton Beach system as compared to open wire and carrier trunk groups from the same toll center. During a study period, the test group of 48 microwave circuits experienced less than 23 hours of lost time per month. Equivalent groups of wire and carrier circuits, however, lost more than 700 hours of operating time per month. In other words, the microwave circuits were 99.99 per cent reliable as compared to the 97.84 per cent reliability of the open wire facilities. While these figures were recorded only during the summer months, the worst storm season for the area, they did cover the period of highest trunk usage and the time during which lost circuits could mean loss of revenue.

Of course, the question might also be asked as to whether or not maintenance expenses were adversely affected with the installation of microwave. Indeed, Southeastern Telephone Co. had no previous experience with technically similar equipment. It was faced with the problem of training men for the new operation. But, many of the central office equipment men were eager for this type of training and some had backgrounds of radio and electronic equipment maintenance. Where possible, men with experience

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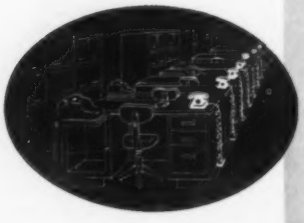

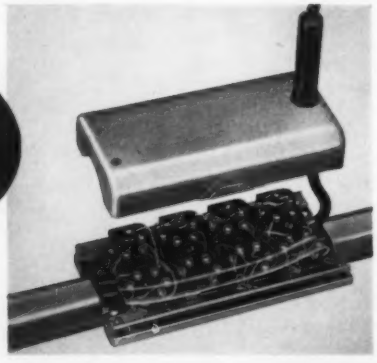

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CARRIER-TELEGRAPH EQUIPMENT

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VOICE-FREQUENCY EQUIPMENT

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D-C TELEGRAPH EQUIPMENT

168I Telegraph Repeater (J70037B) • 10E1 Telegraph Repeater (J70021A) • 128B2 Teletypewriter Subscriber Set (J70027A).

TEST EQUIPMENT

2A Toll Test Unit (X63699A) • 12B, 13A, 30A (J64030A) and 32A (J64032A) Transmission Measuring Sets • 111A2 Relay Test Panel (J66118E) • 118C2 Telegraph Transmission Measuring Set (J70069K) • 163A2 Test Unit (J70045B) • 163C1 Test Unit (J70045D).

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on wire carrier equipment were chosen. They reviewed radio theory and FCC regulations, and successfully passed examinations for first or second-class radio operators licenses. A concentrated course at the manufacturer's training school coupled with on-the-job training during the "turn key" installation then furnished them with excellent basic knowledge of the equipment to be maintained. This is the picture of the training problems involved, with definite extra expenses being incurred. These expenses, however, could actually be considered an investment, to be more than returned with actual savings in maintenance.

Manufacturers design their radio equipment to facilitate preventative maintenance, and properly trained personnel, using proper test procedures, can greatly reduce expenses that would normally result from equivalent investment in wire plant.

Finally, another factor affecting annual charges on plant investment should be considered, that of equipment life or depreciation rates. In many cases depreciation of microwave equipment has been based upon a 10-year life, resulting in annual charges somewhat higher than that made against pole line plant. But in this case, again, there is a counter balance. First, in behalf of microwave, its high salvage value can be pointed out. Should it be necessary to shift radio units from one location to another as called for by adjusted circuit requirements, removal and reinstallation cost would be minor. On the other hand, in recent years relocation costs forced by highway construction have adversely affected investment in toll line plant. And, the increasing highway traffic, with following state or federal government road projects, will in the future lend even greater importance to consideration of pole line relocation costs in determining whether to use microwave or wire plant.

Combining the points mentioned, from equipment costs on down to all differences in annual charges, would for our example prove in the use of microwave.

Future Use? Application of microwave in the future, as in the past, will continue to require answers to the same questions again and again; needs of future expansion, comparable reliability, maintenance expense, and factors affecting service life, as well as comparison of first cost of equipment.

Management people in Southeastern Telephone Co. have given careful consideration to these questions in the past; they have approved the use of microwave in the past; and for the

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future with experience reaped from their own and many other installations they feel assured that this medium of transmission will do all that it is asked in providing expansion of tributary and toll circuits on either the smaller or major routes.

Advantages of Microwave. The preceding paragraphs undoubtedly show that microwave is extremely adaptable to telephone company applications. Although it is not a cure-all, it presents many advantages which are not available in any other type of toll trunking system. An extremely important advantage is its resistivity to elements. Storms and other disturbances that tend to knock out other types of communications do not effect a properly designed and installed microwave system. It is virtually storm-proof and this may be a deciding factor for installation in many areas.

Not to be overlooked, is the importance of microwave links in any civil emergency. Individual stations may be closely guarded to preclude mass sabotage such as may be applied to wire lines. This is one of the many reasons why the FCC looks with favor upon the increased use of microwave for the telephone industry.

Centralized maintenance procedures become a practical reality when a microwave system is installed. Trouble-shooting and maintenance time are reduced due to the fact that there are a limited number of stations where failure may occur. Spare parts may be stocked at a centralized maintenance depot and quickly moved to any particular station that needs them. Preventive maintenance techniques are easily applied to a microwave system and if standby operation is employed there is no reason to expect any lengthy system outages.

Many areas now receive high quality reliable telephone service which can be attained only through the use of microwave. Over rugged terrain, water and other physical obstructions, microwave is the only really practical solution. In many cases, it is the only solution. Costly easements and right-of-ways have always proven troublesome and expensive to the telephone industry. With microwave, these are greatly minimized and, in most instances, equipment can be completely located on existing company property. These facts combined with the cheaper comparative costs of a microwave system have greatly bettered telephone services in rural and remote areas.

Future Outlook. Development in the microwave field, however, has not come to a standstill. There are many improvements which can be made and even today's high quality systems have points which may be improved.

At present, with lengthy microwave systems, many repeater stations are needed. On long toll hauls where no drops are required, these repeater stations serve their intended function very well, but also increase the possibility of failure in the system and increase the over-all cost. To this end, microwave forward scatter systems are being developed which will make the 200-mile microwave hop economical and capable of providing many toll quality circuits. This means that for longer toll systems, 200 miles may be accomplished in a single microwave hop and then appropriate spurs added at the terminals to provide service to the desired areas. This is indeed an important step forward and will serve to make microwave communications even more attractive to present and future users.

The manufacturers of microwave and channelizing equipment alike are striving to produce an even higher channel density system. This is extremely important from the telephone industry standpoint because every extra toll circuit that we can place on the microwave system means extra dollars of revenue. Microwave systems are presently under development for Independent users that will handle up to 2,000 voice channels over a single microwave hop.

Along with the higher channel density development comes the need of improved signal to noise ratios and circuit efficiency. Present microwave circuits are of toll quality and future systems will be effectively noise free.

Conclusion

It is hoped that this article has shown that microwave is extremely practical and a very useful tool for telephone company expansion. A wise and judicious use of this tool will produce results beyond expectation.

FLORIDA EXPANSION

Continued from page 37

and erratic security market of the past few weeks.

"Bear in mind telephone company investment, like other public utility investments, has never been merely a fair weather proposition-blooming profusely in boom times and wilting quickly under any economic pressure. On the contrary, there are a good many conservative investors today, I daresay, who are seriously considering increasing their commitments in public utility operations under present and prospective economic conditions. This is the sort of thing I have in mind when I speak of discovering new opportunities. The problems may be

great, but the stakes are even greater if we work out the right answer."

Mr. Power spoke of the need for cooperation of all Independent telephone companies through their national and state associations, stating:

"Naturally, we are going to need help—each other's help. None of us are so big that we can get along without the other fellow in this Independent telephone industry of ours. That is why USITA was created 60 years ago —in 1897. That is why it has survived and grown to its present state of successful performance. That is why you have developed your Florida Telephone Association.

"Following the old axiom 'in unity there is strength,' these associations at the national and state levels, respectively, are working for the benefit of all of their member companies. And, the benefits are great, indeed."

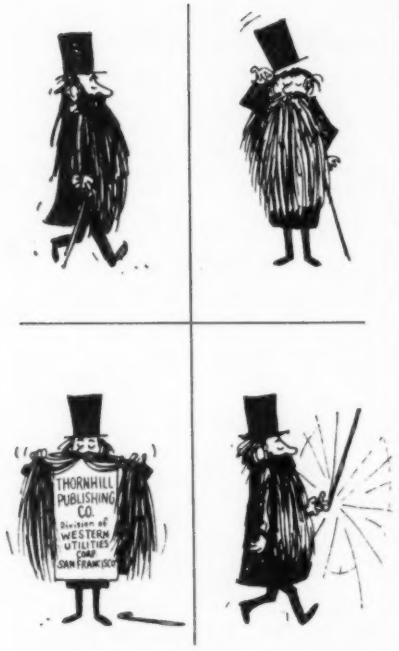
With reference to the problems that will come with future growth, Mr. Power had this to say:

"And, so, both our state and national associations must walk hand in hand into the future. We may well take heart that there is a successful future awaiting us. That must be with us an article of faith and conviction—not merely an expression of hope.

"What alternative have we? What alternative did our Independent telephone pioneers have back in 1897? The only alternative they had was one of defeatism. And, they would never go for that. And, neither would we go for that alternative today. We would be unworthy of a proud heritage if we did. If we had so little faith in the abiding soundness and righteousness of our American way of life, in our enterprise system, we would almost have to agree with Comrade Khruschev. Remember a few months ago on television he said the communists would bury us. Well, he is due for a surprise if he really thinks so.

"The only honorable alternative to defeatism for American business people today is an optimistic faith in the permanence of our own institutions. We must have, and we do have (I am sure I speak for all of us) a profound conviction that we are going ahead. If therefore, you have such faith that our nation and economy will prevail and triumph in the future, as it always has in the past, there will be no hesitation, no turning back. We will do what we have to do, because we *know* that when the black night has passed away and the rocket's red glare has been exhausted, we will see by the dawn's early light that our flag is still there."

During the last day of the convention two conferences were held—Traffic, with E. L. Williams, Jr. of St. Petersburg, district traffic superintendent of Peninsular Telephone Co., presiding, and Commercial and Plant, with E. M. Menendez, of Tallahassee, division commercial manager of Southeastern Telephone Co. in charge.



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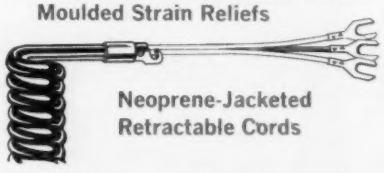

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Featuring the traffic conference were two addresses—"Direct Distance Dialing in Florida," by Mrs. Frances Hill, traffic instructor of Southern Bell Telephone & Telegraph Co., and "Effective Delegation of Authority," by Mr. Williams.

Four addresses were presented at the commercial and plant conference:

"Factors to Be Considered in Developing a Merchandising Program," by Carl W. Carlson, commercial engineer, Winter Park Telephone Co., Winter Park, Fla.

"A Significant Step Forward," by Frank C. Laver, equipment engineer, Peninsular Telephone Co.

"The Potential of Rural Development," by Fred S. McGehee, West Florida Telephone & Telegraph Co., Marianna, Fla.

"Microwave and the Telephone Industry," by J. W. Alfred, Florida connecting company manager, Southern Bell Telephone & Telegraph Co., Jacksonville, Fla.

The following were elected directors by the convention:

M. L. Barre of Jacksonville; H. A. Bishop of Starke; P. E. Brannen of Ft. Myers; Carl D. Brorein, Carl D. Brorein, Jr., and W. A. Brown, all of Tampa; Mrs. Allene M. Drew Cantey of Quincy; E. L. Cox of Perry; M. N. Drew of Quincy; B. A. Galloway and J. K. Galloway, both of Winter Park; J. N. Johnson of Ft. Myers; Ralph Maner of Tampa; Fred S. McGehee of Marianna; E. M. Menendez of Tallahassee; Josephine Poppleton of Tampa; J. L. Sharit of Port St. Joe; R. W. Shriner of Tampa; Blair C. Stone of Tallahassee; Max Wettstein of Ocala; Otto Wettstein III of Live Oak, and C. J. Yates of Jacksonville.

The directors elected the following officers: president, Mr. Sharit; vice presidents, Mr. McGehee and Mr. Menendez, and secretary-treasurer, Miss Poppleton.

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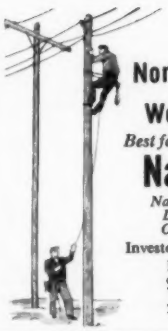

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C. M. Christiansen Co.—Northern White Cedar Poles, Pentachlorophenol treated. Plant and Yards, Phelps, Wis.

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International Creosoting and Construction Co., Galveston, Texas.—Creosoted Southern Yellow Pine Poles. Plants Beaumont and Texarkana, Texas.

International Paper Co., Long Bell Division, 926 Grand Ave., Kansas City, Mo. —Pressure-treated Southern Pine and Douglas Fir Poles. Creosote and Penta preservatives.

Montana Pole & Treating Plant—Box 2004, Butte, Montana. Penta-Pressure treated Lodgepole Pine and Western Larch Poles. Inquiries invited.

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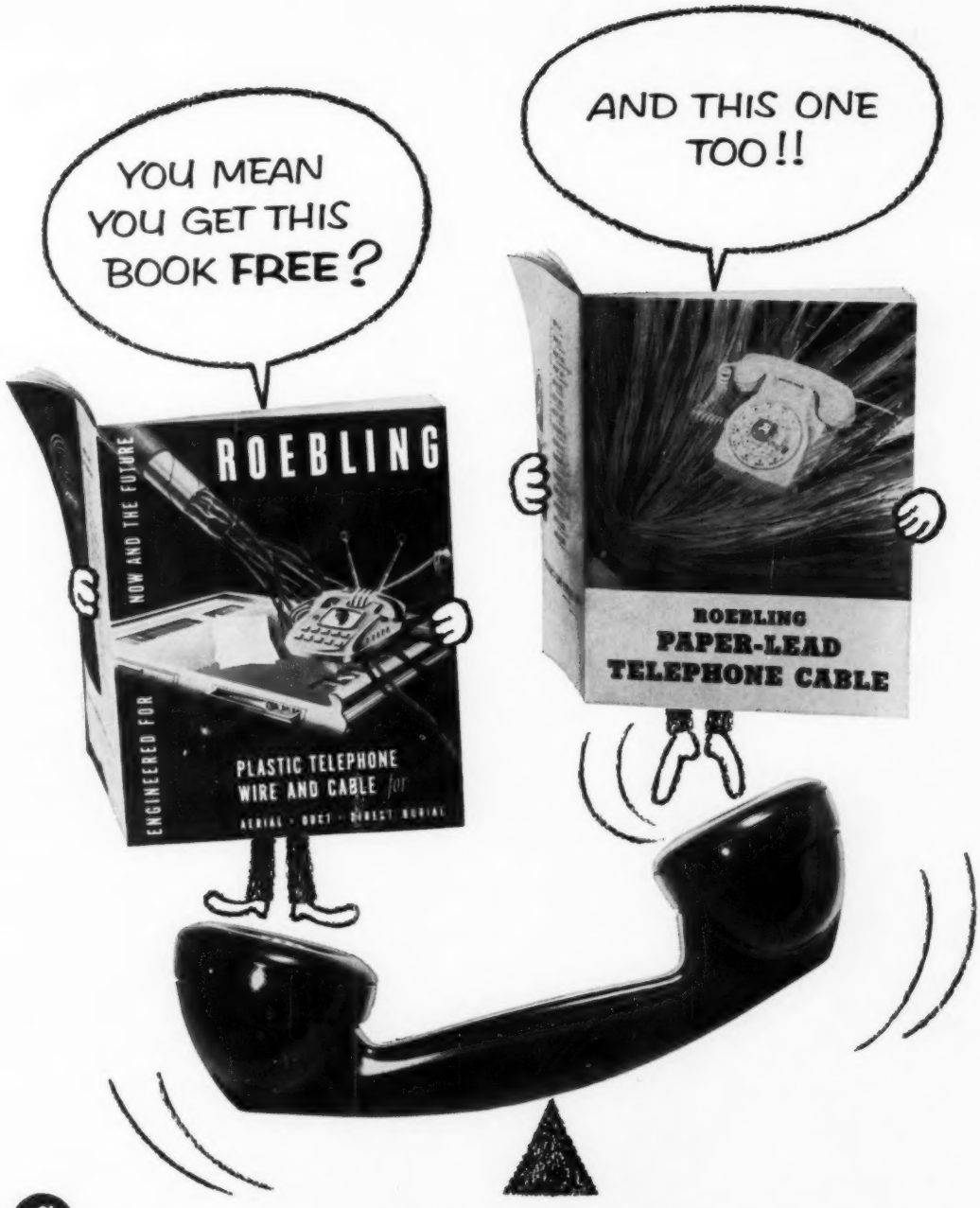

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